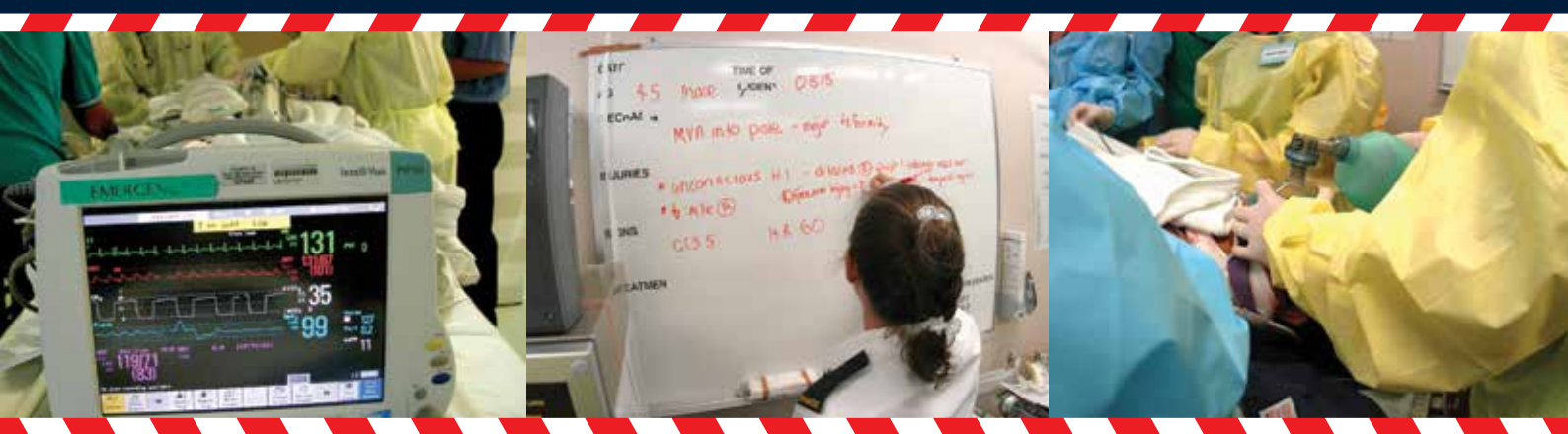


# TRAUMA+2019

Collaboration, innovation and the way forward

3-6 October 2019 | Sofitel Sydney Wentworth, Sydney, NSW

## PROGRAM + ABSTRACT BOOK



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# ACKNOWLEDGEMENTS

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The Trauma 2019 Organising Committee would like to thank the following organisations who at the time of print have given their support:

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# WELCOME

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On behalf of the Australasian Trauma Society and the Trauma 2019 Organising Committee, I would like to welcome you to Trauma 2019, the 23rd Annual Scientific Meeting of the ATS.

The theme of this meeting is Collaboration, innovation and the way forward and I think that statement describes what the delivery of trauma care is all about. We always need to collaborate, we embrace innovation and we are always looking for ways to improve the care that we deliver to our patients.

I hope the Scientific Committee has delivered a program which will stimulate and challenge you. We are particularly grateful to our 2 invited keynote speakers, Professor Karim Brohi and Professor Krista Kaups, who have made the long journeys from the UK and USA respectively. We are very much looking forward to them sharing their knowledge and experience with us.

I would also like to take this opportunity to thank all of our invited and ATS speakers who bring a wealth of knowledge and experience to the meeting.

We also wish to extend a big thank you to our sponsors and exhibitors without whom none of this would be possible.

We have arranged the usual social activities, including the Welcome Reception and the Conference Dinner, which both provide opportunities to relax, catch up with old friends and make some new ones.

I recommend that you also make some time to have a look at some of the sights or try some of the restaurants in the Emerald City of Sydney

I look forward to seeing you during this meeting and I also encourage you to note in your diaries for next year the World Trauma Congress 2020 at the Brisbane Convention and Exhibition Centre.

Thank you once again for deciding to attend this meeting and we hope that you are able to take home some new information to incorporate into your daily practice.



**Tony Joseph**  
**Chair Organising and Scientific Committees Trauma 2019**

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## TRAUMA 2019 PROFESSIONAL CONFERENCE ORGANISER



For all enquiries please contact:

Trauma 2019 Professional Conference Organiser  
C/- The Association Specialists Pty Ltd  
PO Box 576, Crows Nest NSW 1585, AUSTRALIA

Tel: +61 2 9431 8600  
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Web: [www.traumaconference.com.au](http://www.traumaconference.com.au)

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## AUSTRALASIAN TRAUMA SOCIETY



For all enquiries please contact:

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PO Box 576, Crows Nest NSW 1585, AUSTRALIA

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Web: [www.traumasociety.com.au](http://www.traumasociety.com.au)

# ORGANISING + SCIENTIFIC COMMITTEES

- **Ms Maxine Burrell** Trauma Program Manager, Trauma Services, Royal Perth Hospital, Perth, WA, Australia
- **Dr Ian Civil** Clinical Leader, Major Trauma National Clinical Network and Professor of Surgery, Faculty of Medical and Health Sciences, University of Auckland, Auckland, New Zealand
- **A/Prof Daniel Ellis** Acting Director of Trauma, Royal Adelaide Hospital, Adelaide, SA, Australia
- **Ms Andrea Herring** Executive Director, NSW Health Education & Training Institute - HETI, St Leonards, NSW, Australia
- **Prof. Andrew Holland** Senior Paediatric Surgeon, The Children's Hospital at Westmead and Professor of Paediatric Surgery, The Children's Hospital at Westmead Clinical School, The University of Sydney, Sydney, NSW, Australia
- **Ms Alicia Jackson** CNC Trauma Service, Royal North Shore Hospital, Sydney, NSW, Australia
- **Ms Helen Jowett** Trauma Service Manager, The Royal Children's Hospital, Melbourne, VIC, Australia
- **Dr Anthony Joseph** Director of Trauma and Senior Staff Specialist, Emergency Department, Royal North Shore Hospital, and A/Professor Discipline of Emergency Medicine, The University of Sydney, NSW, Australia
- **Dr Kate Martin** General and Trauma Surgeon, The Alfred Hospital, Melbourne, VIC, Australia
- **Ms Trish McDougall** RACS Trauma Quality Improvement Committee Member, Melbourne, VIC, Australia
- **Prof. Michael Parr** Director, Intensive Care Unit, Liverpool Hospital, and A/Professor of Critical Care, South Western Sydney Clinical School, University of New South Wales, Sydney, NSW, Australia
- **Dr Sudhakar Rao** Director of Trauma, Trauma Services, Royal Perth Hospital, Perth, WA, Australia
- **Colonel Michael Reade** Professor of Military Surgery & Medicine SOMCentral, Anaesthesiology and Critical Care, Royal Brisbane and Women's Hospital, Faculty of Medicine and Biomedical Sciences, Brisbane, QLD, Australia



@ANZTrauma

See the latest reports on severe injury @ [www.atr.org.au](http://www.atr.org.au)



**1 in 3**  
deaths caused by  
**TRANSPORT**  
RELATED TRAUMA



**Median ISS**  
for in-hospital  
**DEATHS: 26**

**23% of**  
75+ YEAR OLDS  
died in-hospital



**33%**  
in-hospital  
**DEATHS**  
low falls



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# KEYNOTE SPEAKERS

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## PROFESSOR KARIM BROHI



Karim Brohi is Professor of Trauma Sciences at Barts and the London School of Medicine, and Consultant in Trauma & Vascular surgery at the Royal London Hospital, the UK's busiest major trauma centre. He is the director

of the North East London & Essex Trauma Network, which provides injury care for a population of 5 million people. He co-authored of the joint Colleges 'Trauma Systems – Guidance for Commissioners', was co-chair the 'Acute Care & Surgery' expert advisory group of the National Trauma Reconfiguration, and is on the steering group of the London Trauma System. Karim is also the founder of the Trauma.org web site and Trauma-list email discussion group, both now in their 15th year and with a 25,000-strong global membership.

## PROFESSOR KRISTA KAUPS



Krista Kaups, MD, MSc is a Professor of Clinical Surgery at UCSF Fresno. She is a past-President of the Northern California Chapter of the American College of Surgeons, and a member of the American College

of Surgeons Committee on Trauma, International Relations, Physician Competency and Health Committees, and Health Policy Advisory Group, and numerous other professional societies.

Dr. Kaups received a BA from Bethel University, St Paul, MN and her MD degree from the University of Illinois College of Medicine. After a residency in general surgery in SW Michigan (Michigan State University), she completed a fellowship in Surgical Critical Care at the University of Massachusetts. Dr. Kaups has also earned an MSc (Public Health) from the London School of Hygiene and Tropical Medicine.

She is the Director of the Surgical ICU at Community Regional Medical Center in Fresno, California and directs the surgical critical care fellowship. Dr. Kaups has published in the areas of trauma, critical care and surgeon wellbeing. Her other interests include global health and she has had the opportunity to participate in surgical care and teaching in Albania, Kenya, South Sudan, Sierra Leone, Afghanistan and Thailand.

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# INVITED SPEAKERS

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DR SUSAN ADAMS

DR JONATHON BALL

PROF. ZSOLT BALOGH

DR OLIVER BIRKE

DR CHRISTINE BOWLES

PROF. KARIM BROHI

DR JASON BROWN

PROF. RICHARD BRYANT

DR STEPHEN BUCKLEY

MRS SARA CALTHORPE

PROF. PETER CAMERON

PROF. BRANKO CELLER

DR IAN CIVIL

DR JOHN CROZIER

PROF. KATE CURTIS

DR MICHAEL DINH

DR ANDREW DIXON

DR ALISON DREWRY

DR JOHAN DUFLOU

A/PROF. DANIEL ELLIS

MS GEORGIE FARRAR

PROF. BELINDA GABBE

DR ROWAN GILLIES

DR CRAIG HACKING

DR NEWMAN HARRIS

MS KAYLENE HENDERSON

PROF. KEN HILLMAN

DR LI HSEE

DR KATE HUNTER

DR KENJI INABA

MS HELEN JOWETT

PROF. KRISTA KAUPS

DR PHIL KAY

DR CLAYTON KING

PROF. SUE KURRLE

DR NICK LITTLE

DR KATE MARTIN

DR SALLY MCCARTHY

DR ALASTAIR MORRIS

MS MEGAN OAKEY

DR MICHAEL PARR

DR CLARE RICHMOND

MS SOPHIE SHAND

DR LISA SHARWOOD

DR BRAHMAN SIVAKUMA

DR WARWICK TEAGUE

DR KEVIN TETSWORTH

DR SHANE TREVITHICK

DR ALEX TZANNES

DR CHRIS WAKEMAN

DR CHRIS WARD

DR MARY-CLARE WAUGH

DR ANDREW WINES

DR MICHELLE WITHERS

# PROGRAM

## THURSDAY 3 OCTOBER 2019

0900-1100	<b>Trauma Research Forum</b> <i>Hobart Room</i>	0900-1330	<b>REBOA Workshop</b> <i>Edwin Flack Room</i>	0830-1530	<b>Trauma Nursing / Trauma Data Management Workshop</b> <i>Adelaide Room</i>
1300-1700	<b>Radiopaedia Trauma Radiology Workshop</b> <i>Hobart Room</i>	1400-1700	<b>SPARE</b> <i>Edwin Flack Room</i>		
1700-1900	<b>Injury Reviewer Workshop and Reception</b> <i>Hobart Room</i>				

## FRIDAY 4 OCTOBER 2019

0800-1000	<b>Opening Plenary Session 1</b> <i>Perth/Sydney Room</i> Chair: Prof. Michael Parr				
0800-0805	Welcome to Country				
0805-0815	Official Opening <b>The Hon. Brad Hazzard, NSW Minister for Health and Medical Research</b>				
0815-0840	Innovations in trauma resuscitation - Now and next <b>Prof. Karim Brohi</b>				
0840-0905	Shock assessment, what do we really know? <b>Prof. Krista Kaups</b>				
0905-0930	Digital technology in trauma management and measuring outcomes <b>Prof. Branko Celler</b>				
0930-0955	What is the evidence for current injury prevention strategies <b>Dr Kate Hunter</b>				
0955-1000	Questions				
1000-1030	<b>Morning Tea</b> <i>Foyer and Brisbane Room</i>				
1030 - 1230	<b>Concurrent Session 1</b> <b>Trauma Surgery Conundrums</b> <i>Perth Room</i> Chair: Dr Sudhakar Rao	1030 - 1230	<b>Concurrent Session 2 - Trauma Radiology</b> <i>Sydney Room</i> Chairs: Dr Craig Hacking and Dr Andrew Dixon	1030-1230	<b>Concurrent Session 3 - Free Papers</b> <i>Melbourne Room</i> Chair: Helen Jowett
1030-1050	Penetrating neck injury <b>Dr Li Hsee</b>	1030-1050	Trauma chest x-ray <b>Dr Andrew Dixon</b>	1030-1045	Determining the priorities for change in paediatric trauma care delivery in NSW, Australia <b>Prof Kate Curtis</b>
1050-1110	Brachial plexus injury: An update on diagnosis and treatment <b>Dr Brahman Sivakuma</b>	1050-1110	Dual bolus CT in trauma <b>Dr Craig Hacking</b>	1045-1100	Evaluating the impact of simulated multidisciplinary trauma team training on patient outcomes and team performance to inform translation to clinical practice. <b>Ms Margaret Murphy</b>
1110-1130	Recent advances in the management of severe traumatic brain injury <b>Dr Nick Little</b>	1110-1130	Common misses and misinterpretations on trauma CT <b>Dr Andrew Dixon and Dr Craig Hacking</b>	1100-1115	Abdominal CT imaging in paediatric trauma: guiding better decisions <b>Dr Warwick Teague</b>
				1115-1130	When you live regionally you just don't have that access. Provider perceptions of access to healthcare for seriously injured patients. <b>Miss Gemma Keeves</b>

## PROGRAM CONTINUED

1130-1150	Contemporary management of spinal cord injury <b>Dr Jonathon Ball</b>	1130-1150	Trauma cervical spine MRI <b>Dr Andrew Dixon</b>	1130-1145	Perineal trauma in children- the bottom line <b>Dr Susan Jehangir</b>
		1150-1230	Quiz session Dr Andrew Dixon and <b>Dr Craig Hacking</b>	1145-1200	Reliability, validity and responsiveness of four outcome measures for assessing mobility and physical function in patients following traumatic injury <b>Mrs Sara Calthorpe</b>
1150-1210	Pelvic trauma controversies <b>Prof. Zsolt Balogh</b>			1200-1215	The Comprehensive Trauma Life Support (CTLS) course in India <b>Dr Nagarajan Ganapathy</b>
1210-1230	Questions			1215-1230	The Development of a Nurse-Led Tertiary Survey Process <b>Mr Matthew Sawyer</b>
1230-1330	<b>Lunch</b> <i>Foyer and Brisbane Room</i>				
1245-1330	<b>Australasian Trauma Society - Annual General Meeting</b> <i>Sydney Room</i>				
1330-1530	<b>Concurrent Session 4 - Trauma Education and Teaching</b> <i>Perth Room</i> Chair: Andrea Herring	1330-1530	<b>Concurrent Session 5 - Paediatric Trauma</b> <i>Sydney Room</i> Chair: Prof. Andrew Holland	1330-1530	<b>Concurrent Session 6- Trauma Rehabilitation</b> <i>Melbourne Room</i> Chair: A/Prof. Daniel Ellis
1330-1350	Avoiding burnout (in trauma surgeons/ clinicians) and promoting resilience <b>Prof. Krista Kaups</b>	1330-1350	Paediatric burns: What's new in resuscitation and emergency care? <b>Dr Warwick Teague</b>	1330-1350	Brain injury in adults <b>Dr Clayton King / Dr Stephen Buckley</b>
1350-1410	Improving the NSW Trauma System <b>Dr Michael Dinh</b>	1350-1410	Paediatric injury outcomes and advocacy: Using research to change practice <b>Prof. Kate Curtis</b>	1350-1410	Closing the gap in rehabilitation <b>Dr Alison Drewry</b>
1410-1430	Trauma team training: Real time Auckland Uni group <b>Ms Kaylene Henderson</b>	1410-1430	Splenic trauma in children: An update <b>Dr Susan Adams</b>	1410-1430	PTSD after Trauma - latest Research <b>Prof. Richard Bryant</b>
1430-1450	Training the police force for Trauma Management <b>Dr Kenji Inaba</b>	1430-1450	Psychological first aid response for children after major trauma <b>Ms Helen Jowett</b>	1430-1450	Physical rehabilitation: challenges <b>Mrs Sara Calthorpe</b>
1450-1510	Human factors in trauma team training <b>Dr Christine Bowles</b>	1450-1510	Paediatric open fracture management <b>Dr Oliver Birke</b>	1450-1510	PTA testing practice and pitfalls <b>Ms Georgie Farrar</b>
1510-1530	Trauma Verification and injury prevention: what can we learn? <b>Ms Megan Oakey</b>	1510-1530	Brain injury in children <b>Dr Mary-Clare Waugh</b>	1510-1530	Pain management after Trauma <b>Dr Newman Harris</b>

\*Program is subject to change



## PROGRAM CONTINUED

1530-1600	<b>Afternoon Tea</b> <i>Foyer and Brisbane Room</i>
1600-1800	<b>Plenary Session 2</b> <i>Perth/Sydney Room</i> Chair: Dr Tony Joseph
1600-1630	Gordon Trinca lecture Move fast and break things - Trauma Advocacy 2019 <b>Dr John Crozier</b>
1630-1655	Elderly trauma and the implications of frailty for outcomes <b>Prof. Sue Kurrle</b>
1655-1720	The impact of the frail elderly on the Australasian trauma system design <b>Prof. Peter Cameron</b>
1720-1745	The London trauma system - Power in collaboration <b>Prof. Karim Brohi</b>
1745-1800	Questions
1800-2000	<b>Welcome Reception</b> <i>Foyer and Brisbane Room</i>

SATURDAY 5 OCTOBER 2019					
0700 - 0820	<b>ROTEM/TEG Breakfast Workshop</b> <i>Melbourne Room</i> A/Prof. Daniel Ellis				
0830 - 1030	<b>Plenary Session 3 - Trauma Coagulopathy</b> <i>Perth/Sydney Room</i> Chair: Prof. Michael Parr				
0830-0855	Surgical and adjunctive control of bleeding in coagulopathic patient <b>Prof. Krista Kaups</b>				
0855-0920	Contemporary management of trauma induced coagulopathy <b>Prof. Karim Brohi</b>				
0920-0945	An update on the THANZ Guidelines for the diagnosis and management of venous thromboembolism <b>Dr Chris Ward</b>				
0945-1010	ROTEM is it useful in the exsanguinating patient? <b>A/Prof. Daniel Ellis</b>				
1010-1030	Questions				
1030 - 1100	<b>Morning Tea</b> <i>Foyer and Brisbane Room</i>				
1100 - 1230	<b>Concurrent Session 7- Trauma Management and Outcomes</b> <i>Perth Room</i> Chair: Dr Kate Martin	1100-1230	<b>Concurrent Session 8 - Special Trauma Groups</b> <i>Sydney Room</i> Chair: Prof. Kate Curtis	1100 - 1230	<b>Concurrent Session 9 - Free Papers</b> <i>Melbourne Room</i> Chair: Maxine Burrell
1100-1115	Collaboration for better outcomes in ICU patients <b>Prof. Krista Kaups</b>	1100-1115	Trauma Management in the NSW Prehospital Environment <b>Dr Shane Trevithick</b>	1100-1115	Pre-injury health status of major trauma patients with orthopaedic injuries <b>Mr Asmare Gelaw</b>
1115-1130	37 years since the first trauma team; what's changed <b>Dr Phil Kay</b>	1115-1130	Forensic trauma pathology and lessons learnt <b>Dr Johan Duflou</b>	1115-1130	Optimizing access and configuration of trauma centre care in New South Wales <b>Dr Michael Dinh</b>
1130-1145	Withdrawal of treatment and organ donation in the ICU <b>Dr Michael Parr</b>	1130-1145	Trauma in pregnancy, an update <b>Dr Alastair Morris</b>	1130-1145	Psychiatric comorbidities in adult survivors of major trauma: findings from the Midland Trauma Registry <b>Dr Grant Christey</b>

\*Program is subject to change

## PROGRAM CONTINUED

1145-1200	Is damage control causing more damage? The open abdomen in trauma <b>Prof. Krista Kaups</b>	1145-1200	Family violence; Strengthening the hospital response <b>Ms Helen Jowett</b>	1145-1200	Correlating injury severity scores and major trauma volume using a state-wide in-patient administrative dataset linked to trauma registry data - a retrospective analysis from New South Wales Australia <b>Dr Michael Dinh</b>
1200-1215	Rural trauma: How to achieve high performance results <b>Dr Sally McCarthy</b>	1200-1215	Trauma within the Indigenous population <b>Dr Michelle Withers</b>	1200-1215	Pelvic Floor Dysfunction Post Pelvic Trauma <b>Mrs Stephanie Hawkins</b>
1215-1230	Questions	1215-1230	Questions	1215-1230	Physical activity and sedentary behaviour six months after orthopaedic trauma: what factors predict recovery? <b>Dr Christina Ekegren</b>
1230-1330	<b>Lunch</b> <i>Foyer and Brisbane Room</i>				
1330-1500	<b>Concurrent Session 10 - Musculoskeletal Trauma</b> <i>Perth Room</i> Chair: Trish McDougall	1330-1500	<b>Concurrent Session 11 - Prehospital Trauma Innovations</b> <i>Sydney Room</i> Chair: A/Prof. Daniel Ellis	1330-1500	<b>Concurrent Session 12 - Free Papers</b> <i>Melbourne Room</i> Chair: Alicia Jackson
1330-1350	Innovations in trauma care osseointegration <b>Dr Kevin Tetsworth</b>		Major crash simulation and management Managing a multi-trauma event including scene management, police involvement, pre-hospital blood use and traumatic cardiac arrest <b>Dr Alex Tzannes</b> <b>Dr Clare Richmond</b> <b>Dr Sophie Shand</b>	1330-1345	The Role of the Digital Rectal Examination in the Initial Assessment of Trauma: A Systematic Review <b>Dr Kirsten Biddle</b>
1350-1410	Impact of rib fixation on quality of life after major trauma with multiple rib fractures <b>Dr Kate Martin</b>			1345-1400	Does chemoprophylaxis prevent venous thromboembolism in burns patients? Findings from the Burns Registry of Australia and New Zealand <b>Dr Lincoln Tracey</b>
1410-1425	Burns and extremity trauma: A collaborative approach <b>Dr Rowan Gillies</b>			1400-1415	Regional variations in burns first aid treatment. Does where you live relate to mortality? <b>Ms Jennifer Gong</b>
1425-1440	Management of complex foot and ankle injuries <b>Dr Andrew Wines</b>			1415-1430	Overview of Major Traumatic Injury In Australia – Benchmarking Between Facilities <b>Prof Peter Cameron</b>

\*Program is subject to change

## PROGRAM CONTINUED

1440-1455	Evidence based management of acute spinal injuries <b>Dr Lisa Sharwood</b>			1430-1445	Designing trauma systems for the future <b>Dr Ben Beck</b>
1455-1500	Questions			1445-1500	Using the Australia New Zealand Trauma Registry to Benchmark Processes of Trauma Care <b>Dr Ian Civil</b>
1500 - 1530	<b>Afternoon Tea</b> <i>Foyer and Brisbane Room</i>				
1530-1730	<b>Plenary Session 4 - Disaster Preparedness</b> <i>Perth/Sydney Room</i> Chair: Dr Ian Civil				
1530-1555	The frail elderly patient: Increased numbers and can we predict survival ? <b>Prof. Ken Hillman</b>				
1555 -1620	Mass casualty preparedness in NZ: The Christchurch experience <b>Dr Chris Wakeman</b>				
1620-1640	Mass casualties in burns: How to manage <b>Dr Jason Brown</b>				
1640- 1700	Australasian Mass Casualty Preparedness: Are we ready? <b>Prof. Belinda Gabbe</b>				
1700-1715	Questions				
1930-0000	<b>Conference Dinner</b> <i>Perth/Sydney Room</i>				

### SUNDAY 6 OCTOBER 2019

0900-1000	<b>Plenary Session 5 - Best Papers of 2018/2019</b> <i>Perth/Sydney Room</i> Chairs: A/Prof. Daniel Ellis and Trish McDougall
	Dr Ian Civil, Prof. Michael Parr and Dr Tony Joseph
1000 - 1030	<b>Morning Tea</b> <i>Foyer</i>
1030 - 1200	<b>Plenary Session 6 - Injury Prevention: A Call to Action</b> <i>Perth/Sydney Room</i> Chair: Dr Tony Joseph
	Dr John Crozier, Prof. Krista Kaups, Prof. Karim Brohi, Dr Ian Civil, Prof. Michael Parr, Andrea Herring , Dr Ben Beck, Megan Oakey

\*Program is subject to change

# POSTERS

The posters will be displayed in the Brisbane Room of the Sofitel Sydney Wentworth on Friday 4 October and Saturday 5 October 2019.

Poster Board Number	Presenting Author	Title
1	Stella J Rodgers	Therapeutic Crisis Intervention in Schools (TCI-S); A Trauma and attachment-informed system approach to behaviour in Western Australian specialised Schools.
2	Lisa M Reichelt	Trauma resuscitation: A Nursing education response to increasing incidence of Emergency Department thoracotomy and traumatic cardiac arrest
3	Gaurav Kaushik	A Registry software for road traffic injury surveillance at Apex trauma centre in India - An Innovation
4	Pauline M Miller	Traumatic Radiocarpal Fracture Dislocation with Carpal Coalition; Learning Points from a Recent Case at Royal Perth Hospital
5	Siew Ming Dr Tan	Analgesia for paediatric extremity fracture in the emergency department
6	Kirsten Biddle	Characteristics of Non-Survivable Deaths Secondary to Severe Traumatic Brain Injury
7	Anthony P Stead	Premature Mortality Due to Traumatic Brain Injury Over a 10 Year Period
8	Kirsten Biddle	Prevention of Complications in Geriatric Trauma Patients – The Role of the Orthogeriatric Team
9	Lara A Kimmel	Association between discharge destination and patient reported outcomes following isolated lower limb fracture
10	Alexander Herzog	Hip Spica Cast Immobilisation in the Treatment of Femoral Shaft Fractures in Small Children
11	Kirsten Biddle	Injury Patterns Associated with Abdominal Seatbelt Sign in Obese Trauma Patients
12	Kirsten Biddle	Multimodal Management of Severe Traumatic Brain Injury: A Retrospective Review of Outcomes
13	William G Veitch	Epidemiology and Management of Severe Pelvic Ring Fractures in Victoria
14	William G Veitch	Effects of Major Trauma Recovery Coordinators on patients' satisfaction with post-discharge services

## POSTERS CONTINUED

15	Jemma Keeves	“Just because we are managing doesn’t mean he’s been managed well.” Factors influencing the care of seriously injured patients in rural and urban settings.
16	Stephanie Chan	A 20-year review of water sports related trauma in children <18 years presented to the Women’s and Children’s Hospital
17	Ranesh Palan	Pre-injury anticoagulation use in Western Australian major trauma patients from 2012-2017: Are we reversing anticoagulation adequately?
18	Janet Amey	A trauma service perspective on cycling related injuries and cycling promotion, 2012-2018
19	Janet Amey	Police motorcycle crash reports and linkage with hospital trauma admissions in the Midland Region of New Zealand, 2012-2016
20	Sam Dickson	Emerging E-scooter related injuries. Are they as “smart” as we think?
21	Siobhan O’Donovan	Fatal paediatric motor vehicle collisions in South Australia: a retrospective analysis of changes in pathological, demographic and vehicular characteristics (1981-2015)
22	Vahid Mehrnoush	Association between leisure time activity and risky driving behavior in young Canadians (16-24 years of age)
23	Kathleen M McDermott	How far is too far? Measuring major trauma outcomes by time to definitive care in the Northern Territory, Australia (2008-2017)
24	jjyotsna punj	Ultrasound is a reliable and faster tool for confirmation of endotracheal intubation compared to chest auscultation and capnography when performed by novice anaesthesia residents - a prospective controlled clinical trial
25	Julia M De Boos	Strangulation and domestic violence: hidden injuries, hidden risks, and a new approach
26	Sandra Braaf	Experiences of managing persistent pain in the first 5-years after serious injury
27	Sophie R Thorn	Platelet transfusions following traumatic brain injury in patients on antiplatelets: More harm than good?
28	Kate Curtis	The priorities for use of the Australia New Zealand Trauma Registry use and Trauma Quality Improvement
29	Danielle Begg	Yoga and Breathing Techniques for Healing Trauma



## POSTERS CONTINUED

30	Kihoon KIm	Effects of delayed intervention in patient with small bowel perforation due to blunt abdominal trauma
31	Charles Coventry	The Operative Trauma Experience of Australian General Surgical Trainees
32	Patricia Lemin	Highway construction zones and transport incidents: are they associated?
33	Demi Beneru	Observational evaluation of use of arterial and venous blood gas utilisation at an urban trauma centre
34	Dr Sally Shepherd	Complex Thoraco-abdominal Trauma: Rib Fractures, Diaphragm Rupture and Small Bowel Herniation
35	Richard Tjahjono	Operative Fixation of Traumatic Rib Fractures: Single-Centre Review of Indications and Early Outcomes
36	BARBARA BLACKIE	Using Simulation Based Training and Assessment to Open a Level 1 Pediatric Trauma Center in the Middle East
37	Kirsten Biddle	The Social Media Sphere of Influence of Trauma Experts in Trauma Education
38	Dharshini Selvarajah	A Study in Scarlet- "Code Crimson" in a Paediatric Trauma Centre
39	Sujeewa Thalaspitiya	A mobile app for management of trauma patients in the hospitals of North Central Province in Sri Lanka
40	Chris Bong	Early pulmonary embolism in trauma patients – a descriptive study
41	Tomomasa Hiramatsu	Liver injuries in children: 24-year experience in a single paediatric tertiary trauma centre in Sydney
42	Ana Galevska	Renal trauma in children – 24 years single tertiary trauma centre experience in metropolitan Sydney
43	Achala Upendra Jayatilleke	Rapid development of a DHIS2 based Web App for disaster situation: Recent experience from Easter bombing in Sri Lanka
44	Janarthan S Muraliharan	Colonic Injuries in Paediatric Traumas
45	Michelle Maddock	Outcomes of Pancreatic Trauma in a Paediatric Population
46	Victoria McCreanor	The burden and cost of injury-related admissions in Queensland
47	Tomomasa Hiramatsu	Liver injuries in children: 24-year experience in a single pediatric tertiary trauma centre in Sydney

# WORKSHOPS

## THURSDAY 3 OCTOBER 2019

### Trauma Nursing / Trauma Data Management Workshop

*\$120 registration fee*  
8:30am to 3:30pm  
Adelaide Room

This pre-conference workshop will appeal to all with an interest in trauma care.

It will focus on:

- Knowledge sharing
- Leadership
- Quality initiatives
- Advocacy
- Personal Development
- Registry
- Clinical Trauma Management

This promises to be a fun and interactive workshop for all involved.

Bring along and share your ideas for the future development of trauma care with other like-minded Trauma professionals in a supportive environment.

*Alicia Jackson and Helen Jowett*  
*Co-organisers*

### Trauma Research Workshop

*Complimentary*  
9:00am to 11:00am  
Hobart Room

The Trauma 2019 Research Forum invites you to submit a summary of current research projects for presentation. This will allow researchers to present their work for feedback regarding clinical application, engaging others in multi-institutional projects, and constructive feedback on how to improve the study design. It will also allow researchers to present work that presents significant logistical challenges so that others may learn from their experience.

### REBOA Workshop

**\$250 registration fee**  
9am to 1pm  
Edwin Flack Room

The ER REBOA workshop will be held over three hours, commencing at 9am and concluding at 12pm. A training manikin will be available for hands on practice in the following skills:

- 1 Femoral puncture and sheath placement
- 2 ER REBOA catheter insertion technique
- 3 ER REBOA catheter removal technique

The work shop will cover all aspects of correct catheter placement and inflation.

### Radiopaedia Trauma Radiology Workshop

*\$250 registration fee*  
1pm to 5pm

Half day interactive trauma CT workshop with radiologists Dr Andrew Dixon (Alfred Hospital) and Dr Craig Hacking (Royal Brisbane and Women's Hospital). Attendees will be required to bring their own laptop to facilitate case viewing. The workshop will consist of interactive cases interspersed with short didactic content and quizzes covering chest, abdomen, pelvis, spine and head trauma.

## SATURDAY 6 OCTOBER 2018

### Visco-elastic Monitoring (TEG/ROTEM) in Trauma Bleeding Workshop

**\$50 registration fee**  
7am to 8:25am  
Melbourne Room

A workshop where the current monitors are demonstrated and aspects of their introduction into hospitals and department discussed. There will be an opportunity for hands on processing of a sample, and demonstration of the software. A small group discussion will cover systems and guidelines that incorporate TEG/ROTEM in clinical decision making in the patient with massive haemorrhage.



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# SOCIAL PROGRAM

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## WELCOME RECEPTION

**Venue:** Foyer and Brisbane Room,  
Sofitel Sydney Wentworth

**Date:** Friday, 4 October 2018

**Time:** 1800-2000

**Dress:** Smart Casual

**Cost:** Included in full delegate registration.  
Day delegate or guest tickets available for \$80.

Directly following the first day of conference sessions we invite all delegates and trade exhibitors to come together for drinks and canapés in the Foyer and Brisbane Room. This is a great way to network, catch up and celebrate the official opening of the conference.

## GALA DINNER

**Venue:** Sydney and Melbourne Rooms  
Sofitel Sydney Wentworth

**Date:** Saturday, 5 October 2018

**Time:** 1930-2400

**Dress:** Cocktail

**Cost:** Full delegate registration: \$60pp  
Day delegate, trade, students & guests: \$150pp

Relax and unwind with your conference colleagues over a 3 course sit down meal and beverages. A live band will of course be there for those that wish to put their dancing shoes on or simply listen to some great music.

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# CPD INFORMATION

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All conference delegates will receive a certificate of attendance after the conference which can be used to claim points for their attendance. The Trauma Conference has received their accreditation for the following CPD points.

## COLLEGE OF INTENSIVE CARE MEDICINE OF AUSTRALIA AND NEW ZEALAND

Trauma 2019 Conference

Lectures – Category 2A: Passive Group Learning - 1 point per hour

Workshops – Category 2B: Active or Interactive Small Group Learning - 2 points per hour

## AUSTRALASIAN COLLEGE FOR EMERGENCY MEDICINE

Trauma 2019 Conference is accredited for 21.5 ACEM CPD hours

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**PH**

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# GENERAL INFORMATION

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## ACCOMMODATION AND LUGGAGE

### **Sofitel Wentworth Sydney**

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Tel: +61 8 9215 2000

Web: <https://www.sofitelsydney.com.au/>

### **Travelodge Martin Place**

165 Phillip St, Sydney NSW 2000

Tel: 1300 886 886

Web: <https://www.travelodge.com.au/hotel/sydney-martin-place/>

### **Adina Serviced Apartments Martin Place**

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Tel: +61 2 93565062

Web: <https://www.adinahotels.com/en/serviced-apartments/sydney-martin-place/>

All delegates are reminded that aside from prepaid room charges all incidentals and charges at the hotel are to be settled upon check out.

Please also note that the Conference Registration Desk has no storage facilities – please leave your luggage with the hotel concierge if attending the conference after you have checked out of your hotel room.

## CREDIT CARDS

Credit cards accepted at the Conference Registration Desk are Visa, Mastercard and AMEX. Merchant fees apply. Most Perth hotels, restaurants and shops will accept all major credit cards.

## CAR PARKING

Parking for Sofitel Sydney Wentworth is located off Bligh Street and is operated by Wilson Car Parking. For any enquiries on parking or parking promotions, please contact Wilson Parking directly.

### **HOTEL GUEST USE**

Parking for Sofitel Sydney Wentworth is located off Bligh Street and is operated by Wilson Car Parking. If you're a guest of the Hotel, parking is charged at \$60.00 per car. Guests have access to unlimited entry and exits during their stay. For any enquiries on guest parking, please call the hotel directly on +61 2 9228 9188.

## DELEGATE LIST

A delegate list was emailed out in advance of the Conference. Delegates who indicated on their registration form that they did not want their name and organisation to appear on the list have been excluded.

## INTERNET

See the staff at the registration desk for details

## LIABILITY DISCLAIMER

The Organising Committee, including the Trauma 2019 Professional Conference Organiser, will not accept liability for damages of any nature sustained by participants or their accompanying persons or loss of or damage to their personal property as a result of the meeting or related events.

## LOST PROPERTY

Please report all lost or found property immediately to the staff at the Conference Registration Desk.

## NAME BADGES

All delegates will be given a name badge at registration. For security reasons, we ask that you wear your name badge at all times. This name badge is also the official entrance to all Conference sessions, exhibition, catering areas and social functions.



## GENERAL INFORMATION CONTINUED

### REGISTRATION DESK

Registration material for the event (name badge, function tickets & detailed program) may be collected from the Trauma 2019 Registration Desk during the below times.

Thursday 3 October 2019

0800 – 1700

for pre-conference workshop attendees

Friday 4 October 2019

0700 – 2000 hours

Saturday 5 October 2019

0700 – 1730 hours

Sunday 6 October 2019

0830 – 1200 hours

The Registration Desk will be located in the Pre-Event area on Level 3 and staff will be happy to help with any queries.

### SMOKING POLICY

The Sofitel Wentworth Sydney is a non-smoking venue. Smoking is strictly prohibited in all enclosed public spaces. This policy also applies to restaurant, shopping centres and bars in Sydney.

### SPEAKER PREPARATION

All speakers are asked to check their audio-visual material before presenting. We ask that you check-in with the audio-visual technicians at least 2 hours prior to your presentation, or first thing in the morning of your talk.

The speakers preparation room is located in the Canberra Room. Presentations of each session will be loaded onto a secure server for easy access during your talk.

## RACS Trauma Verification

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## Pedestrians – staying safe



Don't miss your chance to explore the topic with presentations from some of the foremost experts on risk factors, prevention strategies and the way forward.  
Convener: Dr Valerie Malka, Chair RACS Road Trauma Advisory Committee / Trauma Director, Liverpool Hospital  
Venue: Royal Australasian College of Surgeons, 250 – 290 Spring St, East Melbourne

Wednesday 13 November 2019 - 9:00am – 4:00pm

Cost: \$165 (inc GST) Includes lunch, morning and afternoon tea.

### Register online:

W: <https://www.surgeons.org/resources/interest-groups-sections/trauma/trauma-week>

### Queries:

E: [trauma@surgeons.org](mailto:trauma@surgeons.org)

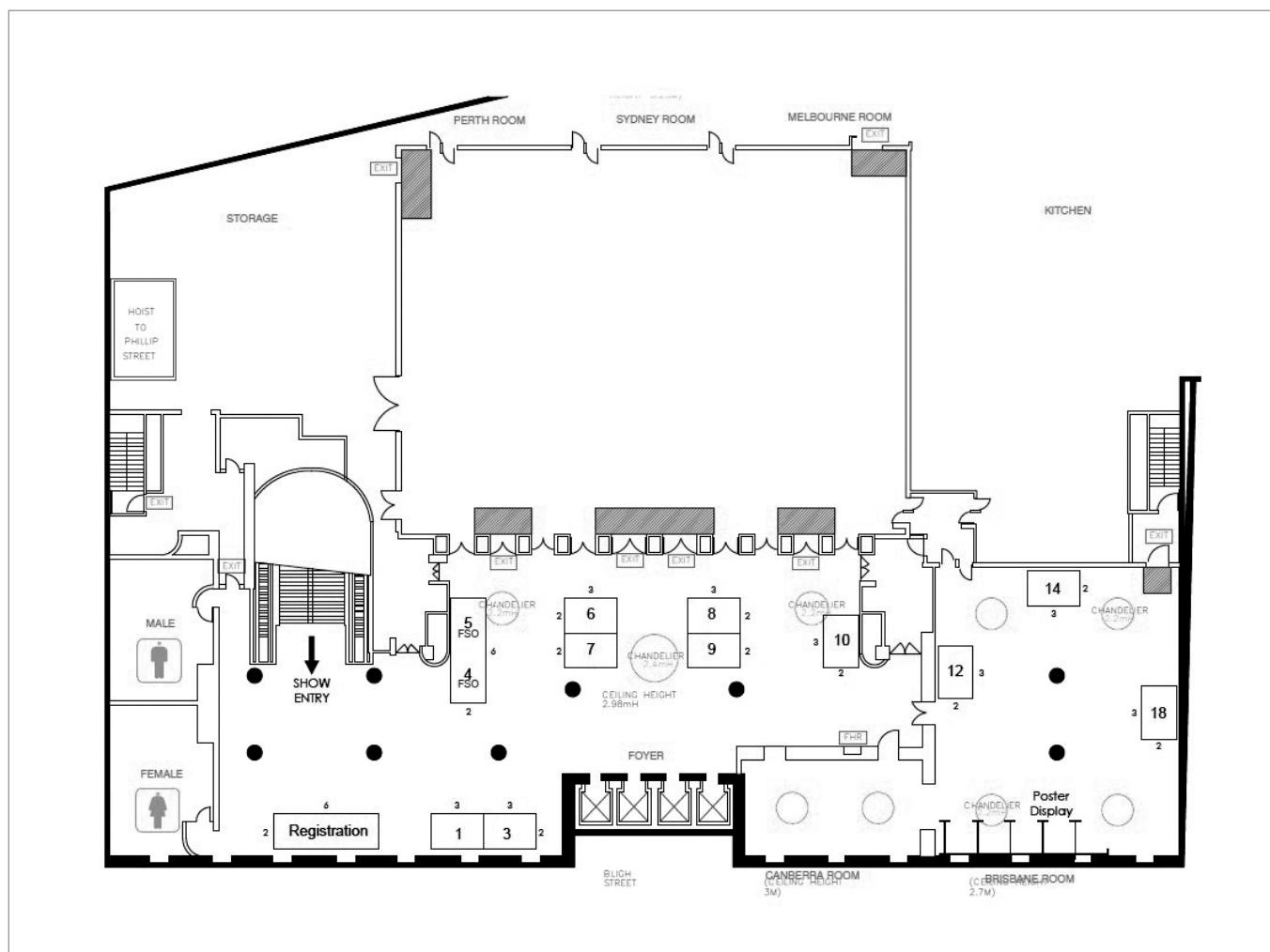
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# EXHIBITION FLOOR PLAN

Pre-Event Foyer, Sofitel Sydney Wentworth

Company	Booth No.
iSimulate	1
PolyNovo	3
Midmed	4 & 5
Fujifilm Sonosite	6
Defence Force Recruiting	7
Importing Innovations Surgical	8
Agency for Clinical Innovation - NSW Institute of Trauma and Injury Management (ITIM)	10
Life Health Care	11
Seimens Healthineers	12
OPC Health	14
Werfen	18



# SPONSORS AND EXHIBITORS

The trade exhibition will be located in the Pre-Event Foyer and is open 0930-2000 on Friday 4 October and 0730-1530 on Saturday 5 October. Tea breaks and lunch will be served in this area to enable you to visit all exhibitors whose support of Trauma 2019 is invaluable and much appreciated.

## AGENCY FOR CLINICAL INNOVATION STAND 10

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The Agency for Clinical Innovation works with clinicians, consumers and managers to design and promote better healthcare for NSW. The ACI is the lead agency for innovation in clinical care, bringing patients, clinicians and managers together to support innovation, design and implementation. Our vision is to create the future of healthcare, and healthier futures for the people of NSW.

## DEFENCE FORCE RECRUITING STAND 7



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## IMPORTING INNOVATIONS SURGICAL STAND 8



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## SPONSORS AND EXHIBITORS CONTINUED

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IIA Surgical are the Australian Distributors and clinical educators for the ER REBOA catheter for Australia. Our company specializes in sourcing the latest technological advances in trauma management for the control of non-compressible truncal hemorrhage. Early intervention and control of bleeding are critical factors in determining positive outcomes for exsanguinating patients. Visit us at booth 8 to learn more!

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Brent Carlisle  
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[brent.carlisle@isimulate.com](mailto:brent.carlisle@isimulate.com)  
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The NCCTRC was established following the 2002 Bali bombings and has since evolved to become a unique national asset that builds on Australia's strong history of humanitarian assistance. It is focused on enhancing Australia's health security and disaster response capacity in the Top End and is also active in building capacity and relationships across Asia and the Pacific. The NCCTRC provides a combination of readily adaptable and innovative response capabilities; training; teaching; exercising expertise; research initiatives; and mentoring and support for emerging medical teams across the Asia-Pacific. The NCCTRC relocated from Royal Darwin Hospital to the Darwin International Airport in May 2019 and continues to maintain a clinical capability at Royal Darwin Hospital.

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## SPONSORS AND EXHIBITORS CONTINUED

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Organisation overview (50 words max): Werfen is a growing, privately held corporation that was founded in 1966 in Barcelona, Spain. We are a worldwide leader in in vitro diagnostics (IVD) in the specialties of Hemostasis, Acute Care Diagnostics and Autoimmunity. At present, we operate directly in nearly 30 countries and in more than 100 territories through distributors. Our R&D and production centers are located in the United States and Europe. In 2018, our revenues were 1,359M and we had an average workforce of 5,155 people.



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We bring patients, clinicians and managers together to support the design and implementation of innovation in healthcare.

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- **person-centred** – we engage consumers as partners to redesign healthcare
- **clinically-led** – we draw on clinical leadership to build and drive improvements that will change practice
- **evidence-based** – we capture emerging innovations, assess the evidence and evaluate their transformative potential
- **value-driven** – we demonstrate value to patients and providers, and deliver outcomes for the system.

# ETM Course

## EMERGENCY TRAUMA MANAGEMENT COURSE

**The definitive trauma course for doctors who manage trauma**



### ABOUT ETM

The ETM Course is a dynamic, 3 day face-to-face course that teaches trauma reception and resuscitation from the Australasian Emergency Medicine perspective.

Suitable for doctors PGY2 and above through to specialists in Emergency Medicine, Anaesthesia, Surgery, Intensive Care and Rural Generalists.

Accredited in Australia for CME/CPD by ACEM, CICM, RACGP and ACRRM. ANZCA and FPM CPD program participants may claim the ETM Course as a Major Haemorrhage emergency response activity.

### COURSE FEATURES

Short, focused lectures, simulation scenarios and small group interactive sessions including:

- Resus Room Management
- Airway Management
- Chest Decompression
- Vascular Access
- Orthopaedic Trauma
- Management of Traumatic Cardiac Arrest
- Transport and Retrieval
- Other procedures: Spinal immobilisation, CAT tourniquet and lateral canthotomy

**2020 course dates now available**

**[etmcourse.com](http://etmcourse.com)**

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# INVITED SPEAKER ABSTRACTS

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Abstracts listed in order of program. Abstracts included are those that were available at time of print.

## OPENING PLENARY SESSION 1

### Shock Assessment: what do we really know?

**Prof Krista Kaups, MD, MSc, FACS**

*Professor of Clinical Surgery, UCSF Fresno, California, United States*

Although it is generally agreed that the shock state is to be avoided in trauma patients, recognition may be more challenging. The ideal indicator would be reflective of volume deficit, impaired tissue perfusion and “occult” injury and also be rapidly and readily obtainable. A careful review of currently available measures is helpful to evaluating optimal assessments.

## CONCURRENT SESSION 1 - TRAUMA SURGERY CONUNDRUMS

### Contemporary management of spinal cord injury

**Dr Jonathon Ball**

*Neurosurgeon, Department of Neurosurgery, Royal North Shore Hospital, Sydney, NSW, Australia*

Spinal cord injuries (SCI) are among the most devastating of traumatic injuries, affecting sensorimotor and autonomic systems with wide ranging impacts on health, functioning, participation and quality of life. Despite the impressive burden of this disease on individuals and society, there have been only small advances in treatment. Traumatic SCI is characterized by an initial traumatic insult resulting in mechanical damage to cellular membranes, microvasculature disruption, ionic dysregulation, and pro-apoptotic signalling. The resulting secondary injury cascade leads to further damage and neurological dysfunction. Increased understanding of the pathophysiology of spinal cord injury has focussed attention on the importance of early management to limit the secondary injury cascade. Early transfer to specialist spinal cord injury units has been shown to decrease injury-related complications. Evidence continues to emerge

supporting the role of early surgical decompression in improving neurologic outcomes. Studies of spinal cord perfusion suggest standard surgical technique is often inadequate to optimise perfusion of the injured cord and that targeted spinal cord perfusion management will lead to superior outcomes. There are currently no proven pharmacologic agents or cellular therapies that significantly reduce injury severity or functional impairment (ie. are neuroprotective), improve recovery of voluntary motor control, or enhance nervous system regeneration following complete SCI. The use of high-dose methylprednisolone remains controversial. Phase III trials of novel agents including Riluzole (sodium channel blocker) are ongoing. Trials of exogenous cellular therapies remain in Phase I/II.

## CONCURRENT SESSION 2 - TRAUMA RADIOLOGY

### Dual bolus CT in trauma

**Dr Craig Hacking**

*Lead Emergency and Trauma Radiologist, Royal Brisbane and Women's Hospital, Brisbane, Queensland and Academic Lead of Clinical Radiology, Faculty of Medicine, University of Queensland, QLD, Australia*

In this short presentation I will present a recent review I co-authored to compare and contrast the use of split-bolus single-pass CT in the assessment of trauma patients in compared to standard multi-phase CT techniques.

## CONCURRENT SESSION 4 - TRAUMA EDUCATION AND TEACHING

### Avoiding burnout (in trauma surgeons/clinicians) and promoting resilience

**Prof Krista Kaups, MD, MSc, FACS**

*Professor of Clinical Surgery, UCSF Fresno, California, United States*

Burnout is recognized as occurring quite commonly among clinicians, with important deleterious effects to the individual and also to their patients, families and colleagues. Causes of burnout and contributing factors and the resultant detrimental effects will be examined as well as ways to promote resilience both for the person and in the system.

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## INVITED SPEAKER ABSTRACTS CONTINUED

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### PLENARY SESSION 3 - TRAUMA COAGULOPATHY

#### Surgical and adjunctive control of bleeding in coagulopathic patient

**Prof Krista Kaups, MD, MSc, FACS**

*Professor of Clinical Surgery, UCSF Fresno, California, United States*

Hemorrhage control is a critical part of trauma resuscitation, however coagulation may be altered due to pre-existing patient issues, the injuries sustained or a combination of factors. Recognizing the potential causes and options for management are important, both in the initial treatment of the patient and in the subsequent operative care.

### CONCURRENT SESSION 7- TRAUMA MANAGEMENT AND OUTCOMES

#### Collaboration for better outcomes in ICU patients

**Prof Krista Kaups, MD, MSc, FACS**

*Professor of Clinical Surgery, UCSF Fresno, California, United States*

Optimal care of the critically ill patient requires an understanding of the different functions of healthcare team members. Effective patient management for better outcomes, occurs as a result of education, communication and joint efforts involving all members of the staff as well as patients and family members. Ensuring sustainability of initiatives is also an integral part of collaborative efforts.

#### 37 years since the first trauma team; what's changed

**Dr Phillip Kay MB BS (Qld) Dip RACOG FRACGP  
FACEM FIFEM**

*Director of Emergency Medicine, Princess Alexandra Hospital  
Brisbane, QLD, Australia*

Having been involved in setting up Australia's first Trauma Team in 1982 this talk reflects on the

environment and systems back then and compares it to current practice.

The 80's was a high trauma caseload decade with very little ED infrastructure around compared to today. Features of the current environment are discussed. The talk is a trip down memory lane.

#### Is damage control causing more damage? The open abdomen in trauma

**Prof Krista Kaups, MD, MSc, FACS**

*Professor of Clinical Surgery, UCSF Fresno, California, United States*

Although damage control laparotomy (temporary abdominal closure) has been widely adopted in trauma patients with physiologic derangement, evidence demonstrates that this technique is not without significant cost and complication. Recognition of appropriate indications for damage control as well as considerations to minimize the potential complications is essential.

### CONCURRENT SESSION 8 - SPECIAL TRAUMA GROUPS

#### Forensic trauma pathology and lessons learnt

**Dr Johan Duflou**

*Consulting Forensic Pathologist; Clinical Professor, Central Clinical School, University of Sydney; and Conjoint Associate Professor, National Drug and Alcohol Research Centre, University of NSW, Sydney, NSW, Australia*

Forensic pathology is that specialty of medicine which involves the application of pathological methods in the investigation of medicolegal matters. Traditionally in Australia this has been limited to the investigation of deaths for the coroner, but in many parts of the world the forensic pathologist also applies those skills to the investigation of injuries, intoxications and various other medical conditions in the living as well.

Observations made by the forensic pathologist can provide insights which can provide important information for the justice system. Injuries which are often of greatest forensic significance in a case and on which the forensic pathologist will concentrate

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## INVITED SPEAKER ABSTRACTS CONTINUED

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on are those which are clinically insignificant for the management of the patient but which provide important information on the interactions of persons involved in altercations and allow for reconstruction of events.

This presentation examines a number of common problems in injury assessment and interpretation in both the living and the dead, considers various alternative explanations, and highlights some of the consequences of errors made in those assessments in the justice system.

### PLENARY SESSION 4 - DISASTER PREPAREDNESS

#### The frail elderly patient: Increased numbers and can we predict survival?

##### Prof Ken Hillman

*Professor of Intensive Care, University of New South Wales, Director of the Simpson Centre for Health Services Research affiliated with the Ingham Institute for Applied Medical Research, Sydney, NSW, Australia*

One of the most important challenges in health is the increasing number of elderly people being admitted to acute hospitals. Our hospitals are geared to managing younger patients with single organ problems treated by specialist doctors in those areas. However, the increasing population of hospitalised patients are old with multiple chronic health issues. Increasingly we are using the term, Frailty to describe the impact of age and chronic health issues. The degree of frailty is strongly associated with short- and long-term outcomes. In the case of trauma, frailty is also associated with the reason for admission, especially in the case of falls, one of the most common reasons for hospital admission. We tend to focus on the acute impact of the fall and manage it rather than see the fall as a measure of the person's frailty. In more advanced cases, the fall may be a marker of the person nearing the end of their life. As well as treating the fall and the associated chronic medical conditions we also need to begin discussions with the patient and their carers about their attitudes and beliefs and formalise their own goals of care. There is increasing evidence that we need to be measuring longer post-hospital outcomes and not just concentrate on hospital mortality as an outcome. For older people having been managed in an ICU

up to 50% have died within one year and many of the remainder have a very poor quality of life. This is not necessarily related to the ICU admission but simply part of the normal trajectory of elderly frail people nearing the end of life. There are now tools to assist us in identifying people near the end of life and standardised approaches essential to empowering people to be involved in shared decision making.

#### Mass Casualties in Burns: How to Manage

##### Dr Jason Brown and A/Director Professor

##### Stuart Pegg

*Adult Burn Centre, Royal Brisbane and Women's Hospital, Brisbane, QLD, Australia*

In contrast to accelerated advances in trauma care which are often the result of major military conflicts, accelerated advances in burns care often result from domestic burns disasters resulting in mass burn casualties.

Difficulties in managing an incident with numerous burn victims are the same in all countries. Burn treatment being challenging and highly specialized, its service provision has been centralized into burns centres. Burn casualties also vary in scope of injury and procedures required and are much more labor and resource intensive than non-burn casualties. With limited available facilities to treat major burns, and their inherent need for greater resources, a small number of large burns from seemingly modest sized disasters can completely overwhelm the local, regional or even national services and constitute a significant burn disaster.

The core elements of the management of burn mass casualties will be considered. These include:

- Prevention
- Preparedness
- Communication
- Scene Command and Triage
- Patient Evacuation
- Resource Utilisation
- Treatment Strategies

On June 9th, 2015, 21 casualties resulted from an explosion in a café located in the remote township



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## INVITED SPEAKER ABSTRACTS CONTINUED

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of Ravenshoe, Queensland. This remains the largest burn mass casualty event in Queensland to date. The response to this will be examined in the context of the core elements of management. Focusing on the inherent challenges in managing mass burn casualties in the Australian context and the lessons learnt from the disaster.

### Australasian Mass Casualty Preparedness: Are we ready?

**Belinda Gabbe<sup>1</sup>, Tony Joseph<sup>2</sup>, Kate Curtis<sup>3</sup>, David Gomez<sup>4</sup>, Kate Martin<sup>5</sup>, Ian Civil<sup>6</sup>, Avery Nathens<sup>4</sup>, Mark Fitzgerald<sup>7</sup>, Warwick Teague<sup>8</sup>, Andrew Holland<sup>2</sup>, Bill Veitch<sup>1</sup>, Fiona Lecky<sup>9</sup>, Chris Moran<sup>10</sup>**

- 1 Department of Epidemiology and Preventive Medicine, Monash University, VIC, Australia
- 2 School of Medicine, University of Sydney, NSW, Australia
- 3 Susan Wakil School of Nursing and Midwifery, University of Sydney, NSW, Australia
- 4 Department of Surgery, University of Toronto, Canada
- 5 Trauma Service, The Alfred, VIC, Australia
- 6 School of Medicine, University of Auckland, New Zealand
- 7 Department of Surgery, Central Clinical School, Monash University, VIC, Australia
- 8 Department of Paediatrics, University of Melbourne, VIC, Australia
- 9 Centre for Urgent and Emergency Care Research, University of Sheffield, United Kingdom
- 10 NHS England, United Kingdom

**Introduction:** Mass casualty incidents (MCIs) are increasing over time. Trauma centres play a key role in MCIs due to their constant readiness and the widespread expertise that exists within trauma centres. Previous studies have shown deficiencies in trauma centre disaster preparedness. Therefore, the aim of this study was to describe the current disaster preparedness of Australasian, English and Canadian Level 1 trauma centres.

**Methods:** A cross-sectional survey of 82 level 1 trauma centres was deployed using Qualtrics software. The anonymous survey collected data about disaster preparedness in 9 key areas. Respondents were encouraged to engage with others at their centre to provide an accurate representation of their centre's preparedness.

**Results:** Responses were received from 69 (84%); 61 completed all questions on the survey. 91% had a disaster preparedness committee and 80% had an all-hazards emergency plan. 79% had held a MCI drill in the past 2 years. Only 54% reported a system in place to calculate the maximal capacity, 55% reported the presence of store resources in the case of an MCI, and 58% had a database of staff trained in Emergency Management. Most (74%) sites had a training and education plan available for staff involved in an MCI, 74% included a plan for a professionally conducted debriefing for staff within 24-72 hours of an MCI, while 62% had a post-disaster employee recovery assistance programme. Most sites had appropriate plans for back-up communication and safety and security.

**Conclusion:** The disaster preparedness of Level 1 trauma centres was high for communication, safety and security but there was clear need for improvement in other areas including surge capacity, human resources and post-disaster recovery.



# ORAL ABSTRACTS

## CONCURRENT SESSION 3 - FREE PAPERS

### Determining the priorities for change in paediatric trauma care delivery in NSW, Australia

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2. Illawarra Shoalhaven Local Health District, Wollongong, NSW
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8. NSW Ambulance, Sydney, NSW
9. Northern Sydney Local Health District, Sydney, NSW
10. NSW Institute of Trauma and Injury Management, Sydney, Australia
11. Sydney Local Health District, Sydney, NSW

**Background:** Injury remains the leading cause of death and disability for Australian children, with known variability in the quality of care delivered to injured children. In 2018 an expert peer-review of 535 major paediatric trauma cases in New South Wales was undertaken using a validated clinical, system and human factors peer-review tool. This multidisciplinary review identified contributing factors to clinical incidents in trauma care resulting in 26 recommendations for change. This study prioritises these recommendations for implementation with the aim of improving health service delivery to severely injured children.

**Methods:** A modified-Delphi study was conducted between October 2018 and February 2019. Two rounds of an online survey to rank the suitability and importance of each of the 26 recommendations was

conducted. Final decisions on the priorities for change in the paediatric trauma system was determined by a consensus of  $\geq 80\%$  for importance and/or suitability.

A range stakeholders from across NSW including clinicians and health service administrators, consumers and government representatives participated.

**Results:** One hundred and one participants completed Round 1, and 60 participants completed Round 2 of the modified-Delphi. In Round 1, 13 recommendations reached  $\geq 80\%$  and in round 2, 11 recommendations reached  $\geq 80\%$ . Those ranked highest focussed on pre-hospital airway management, streamlining retrieval and transfer processes, improving hospital nursing ratios and radiology reporting.

**Conclusion:** The prioritisation and implementation of these recommendations, alongside a uniform State-wide trauma case review process with consistent criteria, performance indicators, monitoring and reporting would facilitate improvement in health service delivery to children sustaining severe injury.

### Evaluating the impact of simulated multidisciplinary trauma team training on patient outcomes and team performance to inform translation to clinical practice.

Margaret M Murphy, Kate Curtis, Andrea McCloughen

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2. Westmead hospital, Westmead, NSW, Australia

**Aim:** To determine if simulated multidisciplinary team training influences patient outcomes and teamwork practices when resuscitating critically injured patients and to generate evidence for training trauma resuscitation teams.

**Background:** Trauma teams perform in stressful situations. They are 'flash' teams, mobilised quickly and comprise of different specialties and disciplines. Simulation is promoted as a training strategy. Significant gaps remain in evaluating the impact of this training on clinical practice. Further research is warranted to determine the most effective way to train trauma teams.

**Design:** Mixed methods embedded experimental study.

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## ORAL ABSTRACTS CONTINUED

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**Methods:** Primary quantitative results (time to critical operations, facilitators and barriers to teamwork) were merged with supplementary qualitative results (team members' experiences and perspectives) to explain the influences of simulated multidisciplinary trauma team training on teamwork and patient outcomes.

**Results:** There was a reduction in the time to critical operations in major trauma patients following team training, from 2.63 hours (IQR 1.23-5.12) to 0.55 hours (IQR 0.22-1.27),  $p < 0.001$ . There were fewer deaths in the group requiring critical operations ( $p < 0.001$ ). 16 facilitators and 12 barriers to the use of teamwork in real life resuscitations events were identified. Findings from interviews illustrated that training should focus on developing non-technical teamwork skills specific to 'flash teams', that is trauma teams with unstable membership.

**Conclusion:** Frontline clinicians identified real world experiences that enable or impede team performance in trauma resuscitations. Our findings ascertain why multidisciplinary team training enhances team performance and what content should be incorporated in training programs.

### Abdominal CT imaging in paediatric trauma: guiding better decisions

Warwick Teague, Daniel Hanna, Cameron Palmer, Helen Jowett, Keith Amarakone, Sebastian King

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2. *Trauma Service, The Royal Children's Hospital, Melbourne, VIC, Australia*
3. *Department of Paediatric Surgery, The Royal Children's Hospital, Melbourne, VIC, Australia*

**Background:** The use of computed tomography (CT) is standard for evaluation of paediatric blunt abdominal trauma, despite an associated increased risk of future malignancy.

**Objective:** To develop and assess a clinical prediction tool for paediatric trauma patients at very low risk of intra-abdominal injuries (IAI) requiring intervention, informing abdominal CT decision-making.

**Methods:** Single-centre retrospective study at a state-designated paediatric major trauma service.

Stage 1 (2014-2016) included all children undergoing abdominal CT for trauma. Stage 2 (2017) included any children assessed for IAI, irrespective of imaging. Regression analyses of pre-determined clinical and investigation findings defined a tool to detect children at very low risk of IAI requiring intervention (Stage 1), and assessed tool performance (Stage 2).

**Results:** Stage 1: 76 (23.1%) of 382 children undergoing CT had IAI requiring intervention. A tool was defined in this cohort, namely absence of abdominal pain, abdominal tenderness, decreased breath sounds, chest x-ray abnormality, haematuria, ALT >100. Stage 2: 115 (20.9%) of 549 children assessed for IAI underwent CT, including 76/549 (13.8%) with IAI requiring intervention. In stage 2, the tool showed 100% sensitivity (95%CI 94.0-100) and 74.0% specificity (95%CI 69.7-77.9) for IAI requiring intervention. Clinical application of this tool would have reduced abdominal CT number by 19.1%, negative CT rate by 15.6%, without missing any IAI requiring intervention.

**Conclusion:** A clinical prediction tool using readily-available clinical and investigation findings correctly identifies children at very low risk of an IAI requiring intervention, in whom abdominal CT can be deferred. This tool now requires prospective validation.

### "When you live regionally you just don't have that access." Provider perceptions of access to healthcare for seriously injured patients.

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1. *Pre-Hospital, Emergency and Trauma, School of Public Health and Preventative Medicine, Monash University, Melbourne, Victoria, Australia*
2. *Physiotherapy Department, Epworth Hospital, Hawthorn, Victoria, Australia*

**Objective:** To explore health care provider (HCP) perspectives of factors influencing access to post-discharge health services for seriously injured patients in rural and urban settings.

**Methods:** Semi-structured interviews with 25 allied health professionals involved in outpatient and community-based care of seriously injured patients across rural and urban Victoria.

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## ORAL ABSTRACTS CONTINUED

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**Results:** HCPs across rural and urban settings recognised the importance of continuity of care for patients when transitioning between hospital and community-based services. However, administrative delays and lengthy wait periods limited continuity. HCPs felt that access to cohesive multi-disciplinary teams was important for patients' recovery. In rural areas, the limited availability of psychology, mental health and social support services created a perceived gap in service provision. HCPs stated that compensable patient's eligibility for funding enabled better access to a variety of services, if they were available within that community. Many HCPs reported they needed to be generalists with their clinical skills rather than specialists in rural settings and thus rural patients had less access to specialised trauma care compared to metropolitan patients. HCPs reported that patients were heavily reliant on family support, taxis and volunteer transport services to meet transportation needs. In rural areas, the limited availability of taxi services and public transport, and longer duration of travel were perceived barriers to patients accessing services.

**Conclusions:** There is an identified need to improve availability of specialised services for patients in rural areas. Additionally, greater assistance with transportation needs should be prioritised to optimise access to health services for patients following serious injury.

### Perineal trauma in children- the bottom line

**Susan Jehangir, Soundappan Soundappan Sannappa Venkatraman**

1. *Children's Hospital at Westmead, Westmead, NSW, Australia*

**Background:** The aim of this study was to determine the mechanism, presentation and outcome of children with perineal injuries

**Methods:** A retrospective review was conducted of children less than 16 years with perineal trauma treated at the Children's Hospital at Westmead (CHW) from January 2003 to December 2016.

**Results:** 198 cases were identified. The median age was 6 years (range 0 to 16 years). The age group 5 to 9 years are especially vulnerable (n=92, 47%). Boys accounted for 47% (n = 90) of cases. Trivial injuries indoors (32%)

and outdoors (32%) constituted the majority of cases overall. Presentation may be novel (testicular torsion, priapism) and deceptive (occult internal injury). Accidental injuries as a result of heavy machinery were only found on children 5 to 9 years old (n=4, 100%). There was a trend toward conservative management in recent years

**Conclusions:** Perineal injuries are uncommon and usually trivial. Children 5 to 9 year of age although eager to assert their independence require close parental supervision especially around heavy machinery. With the trend toward conservative management, a careful history of the mechanism and 'on-site' scenario is imperative to avoid missed occult injuries.

### Reliability, validity and responsiveness of four outcome measures for assessing mobility and physical function in patients following traumatic injury

**Sara Calthorpe, Lara A Kimmel, Melissa J Webb, Mark Fitzgerald, Anne E Holland**

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2. *Department of Epidemiology and Preventive Medicine, Monash University, Melbourne*
3. *The Alfred Trauma Service and National Trauma Research Institute, The Alfred, Melbourne*
4. *Alfred Health Physiotherapy Clinical School, La Trobe University, Melbourne*

**Background:** Measuring mobility and physical function in the acute hospital is important as this may predict longer term outcomes following trauma. This study evaluated clinimetric properties of four mobility and physical function measures identified in our recent systematic review: modified Iowa Level of Assistance Score (mILOA); Functional Independence Measure (FIM); Acute Care Index of Function (ACIF) and the Activity Measure for Post-Acute Care (AM-PAC) "6 Clicks".

**Methods:** A prospective study investigating clinimetric properties including feasibility (time for completion and floor/ ceiling effects), inter-rater reliability (intraclass correlation coefficients (ICC), known groups validity (comparison of first physiotherapy review scores compared to those in patients ready for discharge) and responsiveness (effect size (ES) for change between first and last physiotherapy review) for the four outcome measures.

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## ORAL ABSTRACTS CONTINUED

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**Results:** Fifty participants (median age 50 years, 66% male) were included. The most frequent regions of injury were spine (50%) and lower limbs (48%). Average time for completion varied from 35 seconds (mILOA); to nearly 8 minutes (FIM). No floor effects were observed, but ceiling effects were seen at last physiotherapy review for mILOA (25%) and ACIF (22%). ICCs showed excellent inter-rater reliability (range 0.8-0.96). Known groups validity was demonstrated for all measures, with statistically significant differences between first physiotherapy review and discharge (all  $p < 0.001$ ). The ESs were “6 Clicks” 1.71; mILOA 1.95; ACIF 2.27 and FIM 2.69, all representing a very large effect.

**Discussion:** This study provides new information about the clinimetric properties of mobility and physical function measures following trauma. Recruitment is ongoing.

### The Comprehensive Trauma Life Support (CTLIS) course

**Dr Nagarajan Ganapathy**

The Comprehensive Trauma Life Support (CTLIS) course is a multidisciplinary trauma training course aimed primarily at doctors. International Trauma Care (ITACCS) and ITACCS Indian Chapter have collaborated to provide the course in India.

The CTLIS course runs over two days, and has a course manual (provided pre-course), 26 interactive case-based discussions, practical skill stations, a pre-test and in-course testing.

International and Indian national faculty continuously review and revise the manual and presentation materials to ensure they reflect contemporary practice that is applicable to the Indian environment. The emphasis is on a multi-disciplinary team and evidence-based approach to trauma management in India.

Since 2005 more than 32 courses have been conducted in centres including Chennai, Bengaluru, Cochin, Agra, Coimbatore, Chandigarh, New Delhi, Hyderabad, Shillong, Bhubaneswar, Ludhiana in India. In addition, recently Indian faculty have been invited to conduct the course in Assisut, Egypt and Yangon, Myanmar. Currently more than 2100 clinicians have been trained in CTLIS.

Through judicious planning and implementation through the National CTLS coordinator the costs of running the course have been minimized to facilitate registration fees of INR 5000 per delegate.

India has a population of more than a billion people and one of the world's highest death rates from major trauma. There is great need for trauma education and CTLS is a valid course to assist in that process.

### The Development of a Nurse-Led Tertiary Survey Process

**Matthew C Sawyer, James Hamill**

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The trauma tertiary survey (TTS) was developed in the 1990s by Enderson et al <sup>1</sup> and has become common place in trauma centers globally as the standard of care. Historically TTS's are completed by doctors of the admitting team. These doctors, often junior members of the team, may have minimal previous experience performing TTS and rotate frequently within the hospital. Furthermore, trauma patients can be admitted under differing teams' dependent on either their injury pattern or severity of injury. This can lead to variation in the quality of TTS being performed.

At Starship Child Health, we developed a guideline by which the Trauma Nurse Specialist conducts TTS. We outlined a pathway detailing eligibility for a TTS, its components, and contingency should an issue be detected. The Trauma Nurse Specialist utilized this pathway to conduct 10 supervised TTS on patients admitted under paediatric surgery, orthopaedics and neurosurgery. The Trauma Director reviewed TTS findings. At the end of the supervision period the TNS was able to conduct TTS independently, providing feedback of findings to both the trauma director and the admitting team.

The development of this process has not only provided consistency of service, but also helped reduce the workload on junior doctors working in trauma at Starship.

<sup>1</sup> Enderson BL, Reath DB, Meadors J, Dallas W, DeBoo JM, Maull KI. The tertiary trauma survey: a prospective study of missed injury.

J Trauma-Injury Infect Crit Care 1990;30(6):666—9; discussion 669—70.



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## ORAL ABSTRACTS CONTINUED

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### CONCURRENT SESSION 9 - FREE PAPERS

#### Pre-injury health status of major trauma patients with orthopaedic injuries

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**Introduction:** Pre-injury health is an important predictor of outcome after injury. We aimed to: describe patients' pre-injury health status reported 6, 12 and 24 months after orthopaedic major trauma and compare this with Australian normative values; determine the change in pre-injury health status up to 24 months post-injury; and identify factors associated with reported pre-injury health status.

**Methods:** We included major trauma patients with orthopaedic injuries captured by the Victorian State Trauma Registry injured between 2009 and 2016. Pre-injury health status (measured using the EuroQol-Visual Analogue Scale (EQ-VAS)), reported 6, 12 and 24 months post-injury, was compared against Australian normative values using independent sample t-test. The Bland-Altman method of comparison was used to determine the agreement between pre-injury EQ-VAS scores reported 6 to 12 and 6 to 24 months post-injury. Mixed-effects ordinal logistic regression was used to determine predictors of reported pre-injury health status.

**Results:** 3,701 patients were included. Participants' mean pre-injury EQ-VAS scores were significantly higher than Australian normative values ( $p < 0.001$ ). Pre-injury EQ-VAS scores reported 6 months post-injury agreed with pre-injury EQ-VAS scores reported 12 and 24 months post-injury. A significant association exists between pre-injury health status and age, comorbidities, injury characteristics, socioeconomic status and pre-injury work status.

**Conclusions:** Major trauma patients with orthopaedic injuries reported better pre-injury health status compared to the Australian population. Pre-injury health status reported 6, 12 and 24 months post-injury did not differ and thus could be used interchangeably. Both injury and non-injury related factors were associated with reporting better pre-injury health status.

#### Optimizing access and configuration of trauma centre care in New South Wales

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6. Trauma, Westmead Hospital, Westmead, NSW, Australia
7. Surgery, University of Sydney, Sydney, NSW, Australia

**Introduction:** Timely access to trauma care for the population is dependent on a number of factors. One potentially modifiable factor is the number and location of trauma centres (TC). With trauma, there is a well described volume-outcome association. We describe a methodology that evaluates trauma system reconfiguration without reductions in potential access to care. NSW was used as model, given the perceived overabundance of major trauma centres (MTC)

**Methods:** We first evaluated potential access to TC care via ground and air transport through the use of Geographic Information Systems (GIS) network analysis. Potential Access was defined as the proportion of the population living within 60 minutes transport time from potential scene of injury to a TC by road or rotary-wing aircraft. Sensitivity analyses were performed to account for potential transport delays. The configuration of MTC was evaluated with location-allocation and individual removal of MTC, to determine if optimization could occur without reductions in population access to care

**Results:** 86% of the NSW population has potential access to a TC within 60 min ground travel time; potential access improves to 99% with rotary-wing transport. The 1% of the population without TC access resides in 48% of the total land area. There was no change in potential access by ground transport after removing up to 2 MTC in the Sydney basin at 30, 45 and 60 min transport times.

**Discussion:** Redistribution of the number of MTC in the Sydney basin could be achieved without significant impact on potential access to care

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## ORAL ABSTRACTS CONTINUED

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### Psychiatric comorbidities in adult survivors of major trauma: findings from the Midland Trauma Registry

Eva Spijker, Kelly Jones, Jan J.W Duijff, Alastair Smith, Grant Christey

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Information for primary care providers about the outcomes of adult survivors of major medical trauma in the first year of recovery is not widely available. In particular, risks of impairment across multiple domains of functioning are poorly understood.

To determine the extent to which adults' experience impaired health-related quality of life (QoL), symptoms of post-traumatic stress disorder, depression, chronic pain and harmful alcohol use during the year following major trauma, and to identify factors associated with outcomes.

Adults (aged  $\geq 16$  years) admitted to Waikato Hospital following major trauma sustained in Waikato District between 1 June 2010 and 1 July 2011 were sent a questionnaire in their first year of recovery. They were asked about their QoL, mental health, experiences of pain, post-traumatic stress disorder symptoms and use of alcohol.

Sixty-five questionnaires were completed (40% response rate). In the year following major trauma, trauma survivors met criteria for post-traumatic stress disorder (45%), harmful alcohol use (26%), moderate to severe chronic pain (23%) and depression (18%). Reports of poor health-related QoL were common, ranging from self-care difficulties (31%) to pain and discomfort (72%). Younger age, previous psychiatric illness, substance use, intensive care unit admission and length of hospitalization were associated with symptoms. Thirty-seven adults (57%) reported symptoms in at least two domains.

A significant proportion of adults experience adverse psycho-social outcomes in the first year following major trauma. Screening and management of potentially co-morbid psycho-social needs could improve care and outcomes for survivors.

### Correlating injury severity scores and major trauma volume using a state-wide in-patient administrative dataset linked to trauma registry data - a retrospective analysis from New South Wales Australia

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4. *Agency for Clinical Innovation, Chatswood, NSW, Australia*
5. *Centre for Primary Health Care and Equity, University of New South Wales, Sydney*

**Introduction:** Capabilities of trauma registries are currently limited by the use of different injury coding systems between trauma and administrative datasets.

**Objectives:** Use an Abbreviated Injury Scale to International Classification of Disease (AIS-ICD) mapping-tool to correlate estimated injury severity scores and major trauma volume based on administrative data collections with trauma registry data

**Methods:** Adult trauma cases were identified from the New South Wales Trauma Registry (2012-2016) and linked probabilistically using age, facility and date of facility arrival to the Admitted Patient Data Collection (APDC). Estimated Injury Severity Scores (ISS) were derived using the AIS-ICD mapping-tool applied to diagnoses contained in the APDC

**Results:** A total of eligible 13439 cases were analysed. The overall correlation between trauma registry ISS and ISS estimated from APDC using the AIS-ICD mapping tool was low to moderate (Spearman Rho 0.41 95%CI 0.40, 0.43). Based on an estimated ISS cut-off value of 8, there was high correlation between estimated trauma volume and the number of major trauma cases at each facility (Spearman Rho 0.98, 95%CI 0.95, 0.99). Trauma Revised Injury Severity Score (TRISS) was associated with only slightly higher mortality prediction performance compared to estimated ISS (AUROC 0.76 95%CI 0.75, 0.78 versus AUROC 0.74 95%CI 0.73, 0.76).



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## ORAL ABSTRACTS CONTINUED

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**Conclusion:** A low to moderate correlation exists between individual patient ISS scores based on AIS to ICD mapping of in-patient data collection, but a high correlation for overall major trauma volume using the AIS-ICD mapping at facility level with comparable TRISS mortality prediction.

### Pelvic Floor Dysfunction Post Pelvic Trauma

**Carly L McConnell, Stephanie M Hawkins, Catherine L Granger**

1. *Physiotherapy Department, Melbourne Health, Parkville, VICTORIA, Australia*

**Aim:** To explore the incidence and severity of pelvic floor dysfunction in patients post pelvic fractures.

**Design:** Cross-sectional study.

**Method:** Patients presenting with pelvic trauma who were admitted to a tertiary hospital over a two-year period were included. Patients completed the modified Australian Pelvic Floor Questionnaire (APFQ) and International Index of Erectile Function to assess their self-rated presence and severity of pelvic floor dysfunction, rated pre-injury (retrospectively) and post-injury (range 1-2 years).

**Results:** 48 participants (60% male, mean SD age  $54 \pm 17$  years) with pelvic injuries managed conservatively (62%) or surgically (37%) sustained post-accident (29% motor vehicle accident; 27% fall; 29% bike/pedestrian accident; 15% other) were included. Pre-injury bladder, bowel and sexual dysfunction domain scores (mean SD) on the modified APFQ were  $0.080 \pm 0.096$ ;  $0.123 \pm 0.093$ ; and  $0.086 \pm 0.130$  respectively. Post-injury scores were  $1.500 \pm 0.149$ ;  $0.161 \pm 0.118$ ; and  $0.196 \pm 0.231$  respectively. Scores across all three domains decreased (worsened) post-injury ( $p < 0.05$ ). Scores (mean SD) on the International Index of Erectile Function pre-injury also decreased (worsened) over time (pre-  $18.48 \pm 7.4$ ; post-injury  $16.7 \pm 8.1$ ;  $p < 0.05$ ).

**Conclusion:** 1 to 2 years post-pelvic trauma, many participants experience pelvic floor dysfunction. Whilst this study found pelvic floor outcomes deteriorated post-injury, scores remained within normative values. Further studies are required to investigate the usefulness of physiotherapy intervention in reducing the incidence and severity of pelvic floor dysfunction specifically in this population.

### Physical activity and sedentary behaviour six months after orthopaedic trauma: what factors predict recovery?

**Christina L Ekegren, Rachel E Climie, Pamela M Simpson, Neville Owen, David W Dunstan, William G Veitch, Belinda J Gabbe**

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6. *Mary MacKillop Institute for Health Research, Australian Catholic University, Melbourne, VIC, Australia*
7. *Health Data Research UK, Swansea University Medical School, Swansea, UK*

**Background:** Physical activity is increasingly recognised as an important marker of functional recovery following fracture, yet there has been no device-based assessment of activity recovery in working-age adults with fractures. We aimed to measure sedentary behaviour and physical activity two-weeks and six-months following fracture; and determine associated demographic and injury factors.

**Methods:** Two-weeks and six-months following fracture, 83 adults aged 18-69 with upper limb (UL) or lower limb (LL) fractures wore an ActiGraph accelerometer and an activPAL inclinometer for ten days. We calculated sitting time, steps, and moderate-intensity physical activity (MPA), and conducted linear mixed-effects multivariable regression analyses to determine factors associated with temporal changes in activity.

**Results:** Participants with LL fractures sat two hours more ( $p < 0.001$ ), took 66% fewer steps ( $p < 0.001$ ) and engaged in 77% less MPA ( $p < 0.001$ ) than participants with UL fractures. Greater reductions in sitting time were observed for participants: in the youngest age group ( $p = 0.03$ ); with LL fractures ( $p < 0.001$ ); high pre-injury activity ( $p = 0.03$ ); and who were overweight/obese ( $p = 0.02$ ). For steps, greater improvement was observed for participants: in the youngest and middle-aged groups ( $p = 0.03$ ); and with LL fractures ( $p < 0.001$ ).

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## ORAL ABSTRACTS CONTINUED

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For MPA, greater improvement was observed for: middle-aged participants ( $p=0.01$ ); and those with LL fractures ( $p<0.001$ ).

**Conclusions:** Despite expected recovery of mobility six months post-fracture, participants with LL fractures still had lower levels of physical activity, relative to those with UL fractures. Older adults showed less improvement over time, suggesting they are an important target group for interventions aimed at regaining pre-injury activity levels.

## CONCURRENT SESSION 12 – FREE PAPERS

### The Role of the Digital Rectal Examination in the Initial Assessment of Trauma: A Systematic Review

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**Background:** The utility of the digital rectal examination (DRE) in trauma patients remains debated, despite being recommended in the Advanced Trauma Life Support (ATLS) guidelines. We conducted a systematic review which aimed to identify contemporary evidence regarding the accuracy and clinical utility of the digital rectal examination in trauma patients.

**Methods:** A systematic review was performed as per a protocol determined a priori. PubMed, Embase, The Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the Cochrane Central Register of Controlled Trials (CENTRAL) databases were searched. Studies addressing the utility of the DRE in trauma patients were extracted. The Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) tool was used to assess each studies methodological rigour and risk of bias. Due to significant clinical and methodological heterogeneity of included studies, meta-analysis was not feasible.

**Results:** Two prospective and eleven retrospective cohort studies, enrolling a total of 4,280 patients, were selected. Characteristics of selected studies differed considerably. Reported sensitivity and specificity of the clinical findings of the DRE ranged from 0 – 77% and

91 – 100%, respectively. Reported positive predictive value (PPV) and negative predictive value (NPV) of the clinical findings of the DRE ranged from 0 – 100% and 28 – 100%, respectively.

**Conclusion:** Current best evidence indicates that the DRE lacks sensitivity for detecting various injuries in trauma patients, and should not be routinely performed. Clinicians should use their clinical acumen to decide which subgroups of patients, if any, the DRE has clinical utility in.

### Regional variations in burns first aid treatment. Does where you live relate to mortality?

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5. Victorian Adult Burns Service, The Alfred Hospital, Melbourne, Victoria, Australia
6. Heath Data Research UK Institute, Swansea University, Singleton Park, Swansea, United Kingdom

**Background:** Early intervention with burn first aid has shown to improve clinical outcomes and lower mortality rates. This study aimed to describe the variation in burn first aid practice and patient characteristics to explain regional differences in first aid application.

**Methods:** Cases from the Burns Registry of Australia and New Zealand (BRANZ) from July 2016 to June 2018 were extracted to examine the characteristics and outcomes of patients who do and do not receive burn first aid within three hours of injury. Admissions to Australian burn centres were stratified by socioeconomic status and geographic remoteness to explore regional variation in first aid treatment.

**Results:** 6,554 cases were recorded in the BRANZ during the study period. Burn first aid was applied

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## ORAL ABSTRACTS CONTINUED

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to 76% (n=4,991) of cases. When burn first aid was applied, 79% (n=3,774) of cases received best practice first aid, defined as 20 minutes of cool running water within three hours of injury. A greater portion of patients in the highest quintile of socioeconomic advantage (22%) received best practice burn first aid compared to those in the lowest quintile (15%). Patients residing in major cities were more likely to apply best practice burn first aid compared to those in regional and remote areas (64% vs 36%).

**Conclusion:** This paper provides contemporary data about burn first aid. Best practice burn first aid was more prevalent in patients from areas of greater socioeconomic advantage and major cities. This may be explained by greater health literacy, and barriers in accessing a water source.

### Over view of Major Traumatic Injury in Australia – Implications for Trauma System Design

**Peter Cameron, Kate Curtis, Mark Fitzgerald, Emily McKie, Belinda Gabbe, Arul Earnest**

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5. *Illawarra Shoalhaven Local Health District, Illawarra, New South Wales*
6. *National Trauma Research Institute, Melbourne, Victoria*
7. *Central Clinical School, Monash University, Melbourne, Victoria*
8. *Health Data Research, Swansea University Medical School, Swansea, UK*

On behalf of the AusTQIP collaboration

**Background:** Trauma registries are known to drive improvements and optimise trauma systems worldwide. This is the first reported comparison of the epidemiology and outcomes at major centres across Australia.

**Methods:** The Australian Trauma Registry was a collaboration of 26 major trauma centres across

Australia at the time of this study and currently collects information on patients admitted to these centres who die after injury and/or sustain major trauma (Injury Severity Score (ISS) > 12). Data from 1 July 2016 to 30 June 2017 were analysed. Primary endpoints were risk adjusted length of stay and mortality (adjusted for age, cause of injury, arrival Glasgow coma scale (GCS), shock-index grouped in quartiles and ISS).

**Results:** There were 8423 patients from 24 centres included. The median age (IQR) was 48 (28-68) years. Median (IQR) ISS was 17 (14-25). There was a predominance of males (72%) apart from the extremes of age. Transport-related cases accounted for 45% of major trauma, followed by falls (35.1%). Patients took 1.42 (1.03-2.12) hours to reach hospital and spent 7.10 (3.64-15.00) days in hospital. Risk adjusted length of stay and mortality did not differ significantly across sites. Primary endpoints across sites were also similar in paediatric and older adult (>65) age groups.

**Conclusion:** Australia has the capability to identify national injury trends to target prevention and reduce the burden of injury. Quality of care following injury can be benchmarked across Australia and extension of data collection will enhance optimal management of trauma victims.

### Designing trauma systems for the future

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4. *Health Data Research UK, Swansea University, Swansea, United Kingdom*

**Background:** The effectiveness of regionalised trauma systems is dependent on being able to provide appropriate and timely care across large geographical areas. The aim of this study was to investigate potential changes to hospital designations within the Victorian State Trauma System (VSTS) to address shifts in the number and geographic distribution of major trauma patients over time.

**Methods:** We conducted a retrospective review of major trauma using Victorian State Trauma Registry data over the period of 2007-2017. Coordinates of

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## ORAL ABSTRACTS CONTINUED

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ambulance attended major trauma event locations were mapped to small statistical areas. Bayesian spatiotemporal modelling was used to investigate spatiotemporal patterns of major trauma and generate forecasted counts in each small area to 2022. Mixed Integer Linear Programming algorithms were used to model the optimal configuration of the VSTS using 2016/17 data.

**Results:** Over the 11-year period, there were 30,983 major trauma patients. Using spatiotemporal modelling, we identified small areas with high incidence rates and small areas with high increases in incidence over time. Using these data, forecasted counts of major trauma in 2022 were generated.

Under a restricted scenario, one hospital in metropolitan Melbourne was upgraded to a major trauma service and three urgent care centres were upgraded to metropolitan trauma services.

**Conclusion:** This is the first study to forecast future major trauma events and use these data to inform the optimisation of a mature trauma system. This is a highly novel, evidence-based approach to inform the development and configuration of trauma systems that are designed for the future.

### Using the Australia New Zealand Trauma Registry to Benchmark Processes of Trauma Care

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10. *Illawarra Shoalhaven Local Health District, Illawarra, New South Wales*

on behalf of the AusTQIP collaboration

**Background:** Rising costs in healthcare emphasise the importance of obtaining trauma care performance information to improve the quality and efficiency of health care services. We hypothesised that the current performance of trauma centres in Australia and New Zealand matched international best practice.

**Methods:** ANZ data for patients with severe injury admitted to 33 major trauma centres was collected for the period 1 July 2017 and 30 June 2018. Five processes of care were analysed: time from injury to arrival at the emergency department, time to brain CT, time in the emergency department, hospital length of stay, and intensive care length of stay. Boxplots were analysed by jurisdiction.

**Results:** Data from 9,773 patients were included. Two-thirds of patients were transported direct from the scene to definitive care. The median (IQR) time from injury to definitive care was 1.48 (1.07-2.25) hours. The median (IQR) time from hospital arrival to first head CT for patients with a GCS < 13 was 0.73 (0.43-1.23) hours. The median (IQR) time spent in the ED was 4.22 (2.42-7.07) hours. The median (IQR) hospital length of stay was 7.00 (3.71-14.00) days and ICU length of stay was 3.01 (2.00-8.00) days. Variations were noted between jurisdictions and across major centres.

**Conclusion:** The median outcomes for process measures in Australian and New Zealand trauma centres were consistent with international best practice, however there was considerable variation between sites. Ongoing monitoring, sharing of models of care and resourcing is required to reduce variation.



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# POSTER ABSTRACTS

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## Emerging E-scooter related injuries. Are they as “smart” as we think?

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**Introduction:** Since the introduction of 1000 Lime scooters to Auckland city in October 2018 there have been multiple reports of injuries. The aim of this study is to look at injury patterns associated with e-scooter use.

**Methods:** We conducted a retrospective audit on patients who presented to Auckland City Hospital Emergency Department between 15 October 2018 and 22 February 2019. Patients were firstly identified by ED staff and noted in a logbook, and secondly, by searching the trauma registry database using the code ‘lime’. Outcomes of interest were fractures, lacerations, scans, head injuries, ethanol level, helmet use, admissions and operations.

**Results:** 178 patients were identified. 58 patients (32.6%) were either admitted or transferred to another hospital and 39 patients (21.9%) required an operation under general anaesthetic. 73 patients (41.0%) sustained a bony fracture and the single most common type of fracture was the radius. 33 patients (18.5%) had a head injury and 11 of these suffered a skull fracture and/or an intracerebral haemorrhage. Only two patients (1.1%) were wearing a helmet. 20.8% of patients consumed alcohol before being injured. Three times as many patients with a severe head injury had consumed alcohol.

**Conclusion:** The introduction of Lime scooters has resulted in many serious injuries with a significant percentage of patients requiring admission and surgery. We have seen a predominance of wrist and facial injuries, in keeping with other studies. Overall we estimate that injuries are still rare when compared to the number of rides being taken per day.

## Fatal paediatric motor vehicle collisions in South Australia: a retrospective analysis of changes in pathological, demographic and vehicular characteristics (1981-2015)

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Lethal vehicle collisions remain a leading cause of paediatric death in South Australia. A variety of factors influence fatality rate and risk of motor vehicle collisions (MVCs). These factors include: environmental conditions, demographic factors and the use of safety devices such as seat belts and child restraints. While previous studies have been conducted on these factors, they are often fragmented, dated, limited in time frame and constrained by incomplete data.

The study objective was to retrospectively and longitudinally analyse rates of paediatric MVC fatalities in SA and evaluate specific factors that may influence the fatality rate or fatal injury pattern over time. Using data from the traffic accident reporting system for SA (accessed through Centre for Automotive Safety Research) and fatal injury data from coronial autopsy reports (accessed through Forensic Science SA) a retrospective analysis was conducted.

Paediatric MVC fatalities have seen a significant reduction over time with an average of 26 deaths per annum from 1981-1985 to five deaths per annum from 2011-2015. Male paediatric MVC fatalities, notably as passengers, is greater than female paediatric MVC fatalities. Interestingly, there was a higher proportion of fatalities occurring in children in rear seating compared to the front seat. Further, times between 3pm and 6pm have the highest number of fatalities, likely related to an increase in traffic volume associated with after-school activities and finishing times. Cranio-cerebro/spinal trauma remains the most significant cause of fatal injury in this cohort with an increase in the likelihood of lethal chest injuries with increase age.

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## POSTER ABSTRACTS CONTINUED

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### Association between leisure time activity and risky driving behavior in young Canadians (16–24 years of age)

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**Background:** Risky driving behavior (RDB) is the prime risk factor for motor vehicle crashes in youth. A complex of risk factors contributes to RDB. Although leisure activity (LA) is a major constituent of youth daily life, the relationship between LA and RDB has seldom been studied. The purpose of this study was to examine the relationship between LA and RDB amongst young Canadians.

**Methods:** A cross-sectional study using an online survey with young Canadians aged 16–24 was conducted. The survey included sociodemographics, LAs, driving behavior (Australian Behavior Young Novice Driver Scale), and personality trait (Mini-IPIP) questionnaires.

**Results:** Participants (n=964), aged  $18.34 \pm 2.31$ , were clustered into groups of high risk (46.9%), medium risk (32.4%), and low risk (20.7%). The proportional regression analysis showed a significant correlation between LAs and RDB (P-value<0.05): high drug engagement (OR=2.091), high friend engagement (OR=1.981), high social media engagement (OR=1.833), high movie engagement (OR=1.52), high reading/writing engagement (OR=0.606), high volunteering engagement (OR=0.596), high video game engagement (OR=0.56). Some other factors such as driver's owning-car-status (OR=3.014), being male (OR=2.515), being student, (OR=1.585), high driving exposure (OR=2.566), driving independently >3 years (OR=2.114), high/secondary school diploma (OR=0.643), average neuroticism (OR=1.83), extraversion (OR=1.6), and high imagination (OR=1.537) were also significantly correlated.

**Conclusions:** This study has cast light on the possible protective and unfavorable influences of different leisure activities, personality traits and sociodemographic on RDB in young Canadians. Translation of the knowledge to its users may result in a multidisciplinary approach to RDB in youth.

### How far is too far? Measuring major trauma outcomes by time to definitive care in the Northern Territory, Australia (2008–2017)

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**Introduction:** In the regional Top End of the Northern Territory major trauma patients are transferred to the Royal Darwin Hospital (RDH). We compared outcomes by time to definitive care by remoteness area, time to first medical provider, first medical provider type, and time to RDH.

**Methods:** Retrospective analysis of all major trauma defined as Injury Severity Score >12 from the Trauma Registry, RDH, from 1 January 2008 to 31 December 2017. Inclusion criteria; location of injury within the RDH catchment area and time to first medical provider not greater than 7 days after injury. The outcome measures were death, critical care admission, and hospital length of stay (LOS).

**Results:** 1410 patients met the inclusion criteria. Injury date/time was unknown for 131 patients. The very remote regions patients experienced the greatest median length of time; 90 minutes to first medical provider, 9 hours and 28 minutes to RDH. Remote regions patients are 3.9 times less likely to die after reaching RDH than those injured in outer regional areas (95% CI: 1.7–9.1). Very remote region patients were 2.1 times more likely to be admitted to critical care (95% CI: 1.4–3.3) than outer regional areas. Remote and very remote regions patients are twice as likely to experience a longer LOS compared to the outer regional areas (95% CI: 1.3–2.9) and (95% CI: 1.3–3.1) respectively.

**Conclusion:** Patients injured in remote regions are less likely to die in RDH, more likely to need admission to critical care and require longer LOS.



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## POSTER ABSTRACTS CONTINUED

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### Ultrasound is a reliable and faster tool for confirmation of endotracheal intubation compared to chest auscultation and capnography when performed by novice anaesthesia residents – a prospective controlled clinical trial

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**Background:** Anesthesia trainees are frequently involved in resuscitation of patients while working in trauma, emergency and critical care. The trainees may initially take longer time to intubate and unintentionally place the endotracheal tube (ETT) in the esophagus. The present study determined if ultrasound is the fastest method of confirmation of correct placement of ETT compared to capnography and chest auscultation in trainees.

**Method:** First year anaesthesia residents performed intubation in 120 patients recruited after ethical clearance and informed consent. Time to visualize flutter in trachea, double trachea sign, time to appearance of first and sixth capnograph and time to execute chest auscultation was noted.

**Results:** Ultrasonography was statistically fastest method to determine endotracheal intubation ( $36.50 \pm 15.14$  seconds) vs unilateral chest auscultation ( $50.29 \pm 15.50$  seconds) vs bilateral chest auscultation ( $51.90 \pm 15.98$  seconds) vs capnograph first waveform ( $53.57 \pm 15.97$  seconds) vs capnograph sixth waveform ( $61.67 \pm 15.88$  seconds).

**Conclusion:** When teaching endotracheal intubation to novice anaesthesia residents using conventional direct laryngoscopy, ultrasonography is the fastest method to confirm correct ETT placement compared to capnograph and chest auscultation. Mentor can guide trainee to direct ETT towards trachea and can promptly detect oesophageal intubation by double trachea sign.

### Strangulation and domestic violence: hidden injuries, hidden risks, and a new approach

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Non-fatal strangulation (NFS) can be a cause of severe injury. As up to 40% of fatal strangulations have no external signs, and the majority of surviving victims have few or minor injuries, finding those people severely injured remains challenging. The majority of the evidence regarding NFS is largely based on case reports and case series with no robust studies estimating rates of injuries or the best investigation tools. The injuries that are reported make clear that strangulation is a potentially lethal form of injury that should not be ignored in those presenting having been strangled, or in those presenting with neurological symptoms, including strokes, seizures and vascular abnormalities. The safety implications of strangulation are also important as it can be a prelude to homicide.

In North West Queensland, we have a Domestic violence problem. Strangulation is common and we are regularly asked for expert opinions in court. Many of our patients are strangled in remote stations or communities and some present recurrently. When there is no evidence for one particular form of imaging, what imaging modality should we be using, and who should we be transferring to larger centres for review? How do we support our patients as they become our frequent fliers? Should strangulation have a different approach to other forms of domestic violence?

### Experiences of managing persistent pain in the first 5-years after serious injury

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**Background:** Persistent pain is common after serious injury and can contribute to long-lasting mental health, social and emotional problems. The study aimed to explore how people managed persistent pain in the first 5 years following a serious injury.

**Methods:** A longitudinal qualitative study, nested within a population-based longitudinal cohort study, was undertaken in Victoria, Australia, with survivors of serious injury. People aged  $\geq 16$  years were interviewed at 3 (n=66), 4 (n=63) and 5 (n=57) years post-injury. A thematic analysis using a framework approach was performed.

**Results:** Many participants stated they did not achieve effective pain relief with prescription medication and some spoke about learning to accept pain over time. Most reported modifying their work, social, and daily activities to prevent the exacerbation of pain. Some participants reported effective pain management and better function with treatment from physiotherapists, psychologists, masseurs, and pain clinics, but for many accessing these services was inconsistent or restricted. Access issues related to affordability, as some services were not funded or funded for a limited time by Medicare or injury insurers, and some services refused to treat people funded by injury insurers. Other issues included difficulty finding health professionals with expertise in treating people with serious injuries, slow referral to specialist services by general practitioners, and long wait lists for treatment in pain clinics.

**Conclusion:** To promote effective pain management after serious injury and so limit restrictions on social and work activities, all people with serious injuries need timely and equitable access to tailored multidisciplinary pain management.

### Platelet transfusions following traumatic brain injury in patients on antiplatelets: More harm than good?

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41.1% of major trauma patients treated in 2016-17 in Victoria sustained a head injury. Traumatic brain injury in patients on antiplatelet agents is frequently complicated by intracranial haemorrhage. A suggested form of emergency reversal of antiplatelet action in the setting of intracranial haemorrhage is platelet transfusion.

**Aim:** To perform a systematic review assessing the impact on mortality of platelet transfusion in TBI patients on antiplatelet agents.

**Methods:** We searched OVID Medline and OVID Embase combining the phrases "traumatic brain injury" and "platelet transfusion". We included randomised controlled trials and cohort studies. Bias was assessed using the Newcastle-Ottawa Bias Assessment Tool. We performed a meta-analysis on included studies to produce a pooled odds ratio.

**Results:** Ten studies were identified which investigated the impact of platelet transfusion on mortality. No randomised controlled trials were identified. 1368 cases were included, of which 529 (39%) were transfused with platelets. The mean age of patients ranged from 55.5 to 78.3 years. Transfusions were most commonly given based on physician discretion, rather than result-driven protocols. The cohort sizes ranged from 66 (with 23 patients transfused) to 328 (with 166 patients transfused). The pooled odds ratio for mortality was 1.50 (95%CI 0.93 – 2.42).

**Conclusion:** While multiple cohort studies have been performed to investigate platelet transfusion in TBI patients who take antiplatelet agents, randomised controlled trials need to be undertaken to produce high quality evidence. Our systematic review demonstrates uncertainty regarding the effect of platelet transfusion after TBI and provides clinical equipoise for randomised controlled trials.

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## POSTER ABSTRACTS CONTINUED

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### The priorities for use of the Australia New Zealand Trauma Registry use and Trauma Quality Improvement

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**Introduction:** The Australia New Zealand Trauma Registry holds standardised data regarding trauma patients. Little is known about the needs of data providers and clinicians in relation to these data, or their priorities for trauma quality improvement. As clinical experts, trauma clinicians should have input to these as ultimately, their practice may be influenced by report findings. This paper presents the perspectives of multidisciplinary healthcare professionals in Australia and New Zealand about the use of the ANZ Trauma Registry data and trauma quality improvement priorities.

**Methods:** An exploratory survey of key stakeholders from relevant professional organisations was conducted between September 2018 and February 2019. Participants were recruited via a non-random sampling technique to complete an online survey on REDCap. Descriptive statistical and content analyses were conducted.

**Results:** A total 102 trauma clinicians from a range of disciplines and locations participated. The data use priorities for major trauma were clinical improvement and system/process improvement (86.3%). Participants felt that access to trauma data should primarily be for clinicians (93.1%) and researchers (87.3%). Having a standardised approach to review trauma cases across hospitals and trauma care providers was the prevailing priority in Trauma Quality Improvement (TQI).

**Conclusion:** The key priorities identified for trauma registry data use and trauma quality improvement in Australia and New Zealand can contribute to the strategic activities of the key organisations that drive trauma agenda.

### Yoga and Breathing Techniques for Healing Trauma

**Danielle Begg**

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**Background/Objectives:** There is increasing recognition of the importance of the brain and body in the treatment of trauma related symptoms and increasing interest in the use of mind-body therapies as result. In 2016-7, the NSW Service for the Treatment and Rehabilitation of Torture and Trauma Services (STARTTS) evaluated a yoga program with refugee clients and observed benefits across physical, psychological and interpersonal domains. This paper shares some of the key elements of the yoga program implemented.

**Methodology:** Eight groups of refugees were offered free weekly trauma yoga classes in Sydney, Australia. Each yoga class consisted of standardised breathing techniques, movement and relaxation tailored to the needs of participants with consideration for cultural background, psychological state and physical ability.

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## POSTER ABSTRACTS CONTINUED

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**Results:** The results of the yoga evaluation provide evidence for the acceptability of the yoga program for refugee clients, with benefits observed across physical, psychological and interpersonal domains. This presentation will share the key breathing and relaxation techniques used.

**Conclusion/Discussion:** Weekly yoga classes show promise as an adjunct treatment for refugees who experienced torture and trauma. The key breathing and relaxation techniques used have application beyond this program and their potential application within other groups healing from trauma will also be discussed.

### Effects of delayed intervention in patient with small bowel perforation due to blunt abdominal trauma

**Kihoon Kim**

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**Purpose:** To determine whether the time-interval to operative treatment had any impact on the outcomes of patients who underwent surgery for blunt small bowel perforation.

**Method:** Adults (age >18 years) with blunt small bowel perforation, hospitalized at our center between March 2010 and December 2018, were included in the present study. The study patients were divided into 3 groups of  $\leq 8$  h, 8-24 h, and >24 h, and 2 groups of  $\leq 24$  h and >24 h, depending on the time-interval between injury and receiving operative intervention.

**Results:** 52 patients were analyzed. The number of patients in the three groups of  $\leq 8$  h, 8-24 h, and >24 h time-intervals from injury to intervention were 33, 13 and 6, respectively. Mean LOS and ICU LOS of all patients were 35 and 11 days, respectively. The overall mortality rate and morbidity rate were, 6% and 44%, respectively. In a comparative analysis of the 3 groups based on the time interval from injury to receiving operative intervention, there were no significant differences with respect to the LOS, ICU LOS, mortality, and morbidity. In comparison of outcome between groups of 24 or less than 24 hours and groups of more than 24 hours, there were not significant differences in outcomes.

**Conclusion:** Our findings suggest that delay in operative intervention following blunt abdominal trauma does not have a significant effect on the prognosis. A follow-up abdominal CT scan performed after a short time-interval may help reduce the delay in the diagnosis of patients with blunt abdominal trauma with small bowel perforation.

### The Operative Trauma Experience of Australian General Surgical Trainees

**Charles Coventry, David J Read, Rebecca Q Ivers, Andrew JA Holland**

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**Introduction:** Trauma is a core component of the Australasian General Surgical Curriculum and it remains an important part of general surgery. Centralisation of trauma care and an increasing trend towards non-operative management of traumatic injuries has led to a decline in trainee exposure internationally. Similar findings are expected in Australia, but there is little data available. This study seeks to clarify the situation in Australia.

**Methods:** Prospectively-collected trainee logbook data from Australian general surgical trainees between February 2008 and January 2017 were obtained from General Surgeons Australia (GSA) and interrogated for trauma procedures. Results were analysed using descriptive statistics.

**Results:** General surgical trainees performed an average of 29.4 major trauma surgical procedures per trainee during the four to five year training programme, with an average of 11.9 laparotomies and 0.7 thoracotomies for trauma.

**Discussion:** Exposure to surgical procedures for trauma is a challenge for training providers. This data serves as a marker for future progress in this area. Strategies for improving trainees' trauma exposure, including the use of simulation or overseas placements, should be considered to address any potential deficiencies in operative exposure in trauma exposure.



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## POSTER ABSTRACTS CONTINUED

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### Highway construction zones and transport incidents: are they associated?

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3. *Department of Traumatology, John Hunter Hospital and University of Newcastle, Newcastle*
4. *Trauma Services, Gold Coast Health Services, Gold Coast*

**Background:** Transport incidents are among the major causes of trauma and injury in Australia and worldwide. While improving infrastructures can decrease the rate of incidents, the resulted constructions impose a challenge to roads before the projects finish. This study focused on the construction zones along the New South Wales (NSW) Pacific Highway and aimed to investigate if the number of people who had major trauma as a result of a transport incident in a construction zone is higher than the number of people with incidents at other times.

**Method:** Retrospective study was conducted by screening the data of patients admitted to the trauma services, or who died due to traffic incidents on the NSW Pacific Highway 2011-2016.

**Results:** We identified 35 casualties who had the traffic incident on the location of construction zones; from which, 19 had the incident during the active construction dates and 16 before or after those dates. The rate of casualty in active construction zones was 2.21 per 1000 days, which is significantly higher than the rate in non-active dates (1.2 per 1000 days, p-value: 0.035). There was no significant difference between the age, injury severity score and mortality rate of casualties who had incident during the active construction dates and those who had incident in non-construction periods.

**Discussion:** This study indicated that the rate of incidents increased when NSW Pacific Highway construction zones were active. In order to improve the safety of road users during highway road constructions, this result has to be further investigated.

### Observational evaluation of use of arterial and venous blood gas utilisation at an urban trauma centre

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**Background:** Arterial blood gas sampling is an established investigation for risk stratification of critically injured patients. Established guidelines recommend the routine use of an Arterial Blood Gas (ABG). However, ABG sampling is painful and can be complicated by arterial injury. As a result, the venous blood gas (VBG) is a potential alternative screening tool for haemorrhagic shock.

**Methods:** The prevalence of blood gas sampling was examined in major trauma patients. An observational evaluation was conducted on a 9-month sample of trauma presentations with an Injury Severity score (ISS)  $\geq 12$ . Patients ISS  $\geq 12$  were identified by a trained database manager and were evaluated for evidence of blood gas sampling within 4-hours of presentation.

**Background:** Over 9-months 2752 trauma cases were admitted to the trauma unit. Of these 455 had ISS  $\geq 12$ . Overall in-patient mortality was 8.57%. Mean age of non-survivors was 70.84 years (SD 20.4) and survivors was 51.45 years (SD 22.1) (p<0.001). 74.1% were male and median ISS was 17. VBG sampling occurred in 243 (53.4%); ABG sampling in 63 (13.8%); no blood gas was taken in 83 (18.2%) and both samples were taken in 66 (14.5%).

**Conclusion:** Despite guidelines recommending ABG sampling, the majority of patients in this centre received VBG sampling, suggesting that VBG use has been adopted as a surrogate test of perfusion in trauma. Further studies are required to determine what VBG cut-points should be used and if the VBG is a reliable predictor of shock in trauma.

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## POSTER ABSTRACTS CONTINUED

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### Complex Thoraco-abdominal Trauma: Rib Fractures, Diaphragm Rupture and Small Bowel Herniation

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**Introduction:** Diaphragmatic injury is present in 3-8% of patients post-significant blunt trauma, and is associated with rib fractures in approximately 60% of cases (1,2). Viscera that herniate through displaced fractures are at risk of perforation. This is a report of a combined thoracic and abdominal operative approach to the management of a patient with rib fractures and a diaphragmatic injury.

**Case Report:** A 66 year old male with a history of coronary artery disease and asthma presented following a high speed motor vehicle crash. CT scan demonstrated herniation of small bowel through a diaphragmatic tear between displaced right-sided rib 4 to 8 fractures.

On day two of his admission he was taken to the operating theatre. Laparoscopy was performed first, with reduction of the hernia, primary suture repair of the diaphragm, and reinforcement of the repair with a composite mesh. Surgical stabilisation of the rib fractures was then performed via an anterior thoracotomy approach.

**Discussion:** Understanding the interrelated anatomy and physiology of the chest, diaphragm and abdominal cavity is the key to a successful diaphragmatic repair (3). When chest wall integrity is compromised due to rib fractures, the repair of the diaphragm may be complicated. Addressing both the rib fractures and diaphragmatic injury acutely avoided the threat of hollow viscous perforation from the fractured ribs, as well as longer term issues of rib non/malunion and a more difficult delayed diaphragmatic repair.

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2. Thakore S, Henry J, Todd A, et al. Diaphragmatic rupture and the association with occupant position in right-hand drive vehicles. *Injury* (2001) 32, 441-444
3. McDonald A, Robinson B, Alarcon L, et al. Evaluation and management of traumatic diaphragmatic injuries: A Practice Management Guideline from the Eastern Association for the Surgery of Trauma

### Operative Fixation of Traumatic Rib Fractures: Single-Centre Review of Indications and Early Outcomes

Richard Tjahjono, Negin Sedaghat, Corinna Chiong, Jeremy Hsu

1. Westmead Hospital, Sydney, NSW, Australia
2. Faculty of Medicine, University of Sydney, Sydney, NSW, Australia

**Introduction:** Multiple level 1 trauma centres have demonstrated the possible benefits of operative rib fixation in selected patients with traumatic rib fractures. This study evaluates the outcomes of operative rib fixation completed at Westmead Hospital, Australia.

**Methods:** A retrospective analysis of the data on all consecutive rib fixations completed between January 2013 to December 2018 was performed.

**Results:** Sixty-four patients (55 male; average age 55.9 ± 14.1 years) with a mean Injury Severity Score of 22.1 ± 10.1 underwent rib fixation during the study period. Thirty-one patients underwent rib fixation within 3 days. Median hospital length of stay (LOS) was 15.5 (IQR 10.0; 24.8) days. Thirty-seven patients were admitted to Intensive Care Unit (ICU), with median ICU LOS 10.0 (IQR 5.0; 17.0) days. Although rib fixation within 3 days was associated with a reduced hospital LOS (11.5 [IQR 9.0; 22.1] vs 18.3 [IQR 11.3; 27.5] days; p=0.01) and ICU LOS (6.0 [IQR 3.5; 13.3] vs 11.0 [IQR 8.0; 22.0] days; p=0.03), there was no association with number of complications (n=8 vs n=14, p=0.74). Fifty-six patients did not have any surgery-specific complications. Forty-seven patients did not have any general morbidity. The highest observed morbidity included pneumonia (n=8), DVT (n=4), tracheostomy (n=3) and wound infection (n=3). There was one mortality after rib fixation that was not related to surgery.

**Conclusion:** Operative rib fixation is associated with acceptable outcomes. Early fixation may be associated with shorter hospital and ICU length of stay.

1. Sirmali M, Turut H, Topcu S, Gulhan E, Yazici U, Kaya S and Tastepe I. A comprehensive analysis of traumatic rib fractures: morbidity, mortality and management. *Eur J Cardiothorac Surg* 2003;24: 133-8.
2. Slobogean GP, MacPherson CA, Sun T, Pelletier ME, Hameed SM. Surgical fixation vs nonoperative management of flail chest: A meta-analysis. *J Am Coll Surg* 2013;216: 302-11.



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## POSTER ABSTRACTS CONTINUED

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### Using Simulation Based Training and Assessment to Open a Level 1 Pediatric Trauma Center in the Middle East

**BARBARA BLACKIE, Kevin Enright, Graeme Hadley, Guy Brisseau**

1. *SIDRA MEDICINE, DOHA, -NOT APPLICABLE-, Qatar*

Simulation Based Education has become a mainstay for training in health care. The management of major trauma requires highly trained, sophisticated teams to ensure efficient and safe delivery of care. In a new large quaternary children's hospital in the Middle East, a pediatric trauma program was developed to care for approximately 200-250 level 1 and level 2 pediatric traumas annually. The ED staff is a multinational group with varied training and practice backgrounds; some with extensive pediatric trauma experience and some with limited or adult only trauma experience. All staff have ATLS or ANTC and underwent knowledge and skills training in a scaffolded format, then 120 multidisciplinary team based simulations were held over a 12 week period prior to opening. Using the Ottawa Global Rating Scale for Simulation and the Mayo High Performance Team Based Scale during simulations, preliminary data show 1) experienced ED physicians needed between 1-5 simulations for high scores on the Ottawa Global Rating Scale, 2) the communication and team dynamics areas showed the most need for improvement in terms of inconsistent performance on the Mayo High Performance Scale (average scores of 1.1, 1.3 and 1.0 out of 2 for repeating back orders, verbalizing activities out loud and asking for clarification of orders, respectively). Strong team leads enhance communication however with a multi-language, multinational staff, speaking up for clarification of tasks and roles is a challenge for team members. Ongoing simulations and scoring of real time trauma using the same tools are directing further training endeavors.

### The Social Media Sphere of Influence of Trauma Experts in Trauma Education

**Kirsten Biddle, Sudhakar Rao**

1. *Royal Perth Hospital, East Perth, WA, Australia*

**Background:** Social media continues to emerge as an integral part of medical education. It provides versatile platforms which allows clinicians to engage with, learn

from and connect with other professionals within their field, including experts. A popular social media platform Twitter allows users to publish 280 character microblogs, colloquially known as "tweets". Amongst its 330 million monthly users, Twitter estimates an average of 500 million tweets are published each day. Many conferences encourage the use of Twitter as a means of discussion and collaboration amongst attendees and speakers.

**Aim:** We aimed to characterise the social media following of trauma expert Professor Karim Brohi.

**Methods:** The Twitter profile of Professor Karim Brohi was reviewed. Data collected regarding followers included followers twitter handle, location of follower, profession of follower (where available), and components of the followers profile picture. Follower engagement, including Professor Brohi's top 10 most shared and top 10 most liked tweets, was assessed using an online profile analytics program.

**Results:** By May 2019, Professor Karim Brohi had over 12,000 Twitter followers. A significant proportion of these followers worked in the healthcare sector, particularly in the fields of pre hospital, emergency and trauma care.

### A Study in Scarlet- "Code Crimson" in a Paediatric Trauma Centre

**Dharshini Selvarajah, Susan Jehangir, Soundappan SV Soundappan**

1. *Surgery, The Children's Hospital Westmead, Westmead, NSW, Australia*

**Background:** "Code Crimson" is utilised to facilitate the urgent transfer of haemodynamically unstable trauma patients in the Emergency Department (ED) to the operating theatres, for immediate potentially life-saving surgery. It has previously been successfully implemented in a number of adult trauma centres within the greater Sydney metropolitan area. Herein, we present the first implementation of "Code Crimson" within the paediatric setting.

**Methods:** Patients who received treatment under the protocol were identified from the trauma database from inception in 2009 till May 2019. Records were reviewed to include demographics, mechanism, nature and severity of injury, activation of protocol and resuscitation, surgical interventions and outcomes.

## POSTER ABSTRACTS CONTINUED

**Results:** Of the 11 trauma patients, 3 (27%) survived. 6 of the 8 deceased had arrested either prior to arrival or upon arrival at ED (n= 2, no Return of spontaneous circulation (ROSC)). There were 3 pre-hospital activations; the remaining 8 were >5 minutes post-arrival at ED. Once activated, Code Crimson allowed for a highly coordinated response involving multiple personnel.

**Conclusions:** The “Code Crimson” protocol facilitates the rapid and systematic provision of coordinated care to severely injured patients. However, due to the catastrophic nature of the injuries sustained within the patient cohort, mortality was still high.

### A mobile app for management of trauma patients in the hospitals of North Central Province in Sri Lanka

**Sujeewa Thalgasipitiya, Roshan Hewapathirana, Achala Upendra U Jayatilleke**

1. *Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka, Anuradhapura, NORTH CENTRAL, Sri Lanka*
2. *Department of Anatomy, Faculty of Medicine, University of Colombo, Colombo, Sri Lanka*
3. *Postgraduate Institute of Medicine, University of Colombo, Colombo, Sri Lanka*

Traumatic injuries are the leading cause of hospitalization in Sri Lanka for the last couple of decades. Anuradhapura is a district located in North Central province of Sri Lanka where many traumatic injuries, especially road traffic accidents, occupational injuries, trap gun injuries and wild animal attacks are reported frequently. Usually, the first contact is a rural hospital and the majority of the patients are subsequently transferred to the Teaching Hospital Anuradhapura, which is the main tertiary care center in the province. Doctors in peripheral hospitals without specialized training in trauma care contact surgeons in the tertiary care center over the phone for specialized advice. We conducted this study with the objective of introducing a mobile application for medical doctors in rural hospitals to communicate with surgeons in tertiary care settings remotely regarding victims of traumatic injuries effectively.

A data submission and management tools were developed based on the Open Data Kit (ODK) platform, which consists of an open source mobile application and a web server. The mobile app can be installed in

Android smartphones as the data submission tool. Doctors in the periphery can communicate with the center using the mobile App. They can share photos, images with the expert surgeons and get their advice on management and if and when needed to transfer the patients. This low-cost technology can be used for effective management of victims of traumatic injuries at rural hospitals and to create a database which can be used for future research.

### Early pulmonary embolism in trauma patients – a descriptive study

**Chris Bong, Megan Davis, David Lockwood, Fiona Jennings**

1. *Department of Trauma, Princess Alexandra Hospital, Brisbane*
2. *Acute Surgical Unit, Logan Hospital, Brisbane*

**Background:** Pulmonary embolism (PE) is a common occurrence in trauma patients.<sup>1</sup> This study aims to describe characteristics of patients who develop PE shortly into their admission for major trauma.

**Method:** All patients admitted to the Princess Alexandra Hospital with International Severity Score (ISS)>12 from 2016 to 2018 who developed a PE within five days of admission were eligible for selection. 11 patients were selected. Clinical and radiological details were extracted from the hospital's Integrated Electronic Medical Record (IEMR).

**Results:** Nine patients were male and two female. ISS ranged from 14 to 36 with a median of 17. Two patients (both in their 20's) had PE evident on initial imaging, with one having clot demonstrated in the inferior vena cava. Two patients died during admission, neither directly attributable to PE. Seven patients had high-velocity blunt mechanism, 3 fell from standing height, and one was stabbed. Prevalence of injuries was thoracic (9), upper extremity (4), lower extremity (4), closed head injuries (4), abdominal injuries (2) and pelvic fracture (1). Only two received blood products during resuscitation, and two received tranexamic acid. Only two patients had injuries isolated to one AIS region (spinal). None had prior history of prothrombotic disorders.

**Conclusion:** Further studies using larger sample sizes are needed to confirm these preliminary findings and to further investigate the causes of early PE in trauma patients.

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## POSTER ABSTRACTS CONTINUED

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### **Liver injuries in children: 24-year experience in a single paediatric tertiary trauma centre in Sydney**

**Tomomasa Hiramatsu, Ana Galevska, Soundappan Soundappan Sannappa Venkatraman, Andrew Holland**

1. *Children's Hospital Westmead, Westmead, NSW, Australia*

The aim of this study was to evaluate the demographics, injury pattern, and short-term outcome for the management of liver injury in children in The Children's Hospital in Westmead (CHW), a tertiary trauma centre in Sydney. We conducted a retrospective review of all patients transferred to CHW and diagnosed with liver injury between January 1995 and March 2019. Medical records were reviewed and patients' age and sex, mechanisms and pattern of injury, management, and outcome were analysed. During the study period, 145 (85 male) children were admitted with liver injuries. Median age was 10 (5 - 13) years. Median Injury Severity Score (ISS) was 11 (5-17). Majority of cases was blunt injury as a result of motor vehicle collision, managed non-operatively. Mortality rate was 2.8% (four cases), one of which died following massive hemorrhage due to liver rupture. The other three cases were associated with severe brain injury or other cause not directly related to liver injuries.

### **Rapid development of a DHIS2 based Web App for disaster situation: Recent experience from Easter bombing in Sri Lanka**

**Ajith Tennakoon, Priyanga Senanayake, Pramiliyanage, Roshan Hewapathirana, Achala Upendra Jayatilleke**

1. *Institute of Forensic Medicine and Toxicology, Colombo*
2. *Postgraduate Institute of Medicine, University of Colombo, Colombo 07, COLOMBO, Sri Lanka*
3. *Faculty of Medicine, University of Colombo, Colombo*

On Easter Sunday 2019, the commercial capital of Sri Lanka, Colombo city was attacked by extremist

terrorists by blasting six suicide bombs at six different locations mainly Catholic churches and five-star hotels. Over 250 people died and over 500 people were injured due to the series of bombs. Institute of Forensic Medicine and Toxicology (IFMT) is the main judicial service institution in Colombo and death bodies and parts of the bodies of the victims from six locations were brought to IFMT. We conducted this study with the objective of introducing a web application for managing data related to deaths in a disaster situation effectively.

A data management tool was developed based on the District Health Information System (DHIS2), which is a globally accepted free and open source health information management platform. Due to the urgent requirement, a Web App was developed rapidly within 24 hours of the incidence and primary data entry was completed within 36 hours of the incidence. The Web App is responsive, and data can be entered using mobile phones, tablet computers, laptop computers, and desktop computers. In total, 152 dead bodies and parts of the bodies were received at IFMT from six different locations and subsequently entered into the system. Of 152 deaths, 116 were complete bodies and most of them were male (47%). There were both foreign (25%) and local victims belonging to a wide age group. DHIS2 can be used for rapid deployment of information systems in disaster situations.

Rapid development of a DHIS2 based Web App for disaster situation: Recent experience from Easter bombing in Sri Lanka

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### Colonic Injuries in Paediatric Traumas

Janarthan S Muraliharan, Soundappan Soundappan Sannappa Venkatraman, Ana Galevska

1. *Children's Hospital at Westmead, Parkinson, QUEENSLAND, Australia*

Colonic injuries are very infrequent in the paediatric population following trauma. Limited literature exists on colonic trauma with a significant proportion having a delayed diagnosis. A retrospective study of the trauma database at the Children's Hospital Westmead was performed to identify and analyse trauma patients with large bowel injuries over the past 20 years.

In this period 5 children were identified with an average age of 8.4 years and a male to female ratio of three to two. The average injury severity score (AISS) was 18.2 resulting in an average length of stay (LOS) of 16 days. 60% of patients were involved in motor vehicle accident and there were no deaths. Our study describes the clinical course of the identified cohort with comparison to the currently available literature.

### Outcomes of Pancreatic Trauma in a Paediatric Population

Michelle Maddock, Susan Jehangir, Soundappan Soundappan Sannappa Venkatraman

1. *Paediatric Surgery, Children's Hospital Westmead, Sydney, NSW, Australia*

**Background:** A retrospective review of all children admitted to the Children's Hospital at Westmead (CHW) with pancreatic trauma between January 1983 and September 2002 was previously published in 2004.<sup>1</sup> This study found that pancreatic injuries were uncommon in children and were most likely to be sustained as a result of motor vehicle accidents (MVA).

Given that this study was published 15 years ago and significant improvements in both medicine and motor vehicle design have taken place over that time period, this project reviewed all children admitted to CHW between October 2002 and March 2018 to determine if there had been a reduction in the incidence of pancreatic trauma and determine if MVAs remained the commonest cause of injury.

**Method:** This retrospective study used data collected from the prospective trauma database from October 2002 to March 2018 at CHW. All children with pancreatic trauma were included in this study. Data extracted from the database was then analysed and results compared to those previously published.

**Results:** Preliminary results have shown a 44% decrease in the incidence of pancreatic injuries and boys continue to account for the majority of these (85%). Whilst MVAs were the commonest mechanism of injury (40%) in the earlier study, they now account for only 15% of pancreatic injuries with bicycle accidents (42%) now the commonest cause of injury in this population group.

**Conclusion:** This study provides an update on the outcomes of pancreatic trauma in a paediatric population.

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## POSTER ABSTRACTS CONTINUED

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### The burden and cost of injury-related admissions in Queensland

Victoria McCreanor, Cate Cameron, Jacelle Warren, Kirsten Vallmuur, Cliff Pollard

1. *Jamieson Trauma Institute, Herston, QUEENSLAND, Australia*

Injury-related hospital admissions contribute substantially to the workload and costs in acute care settings, however little is known about long-term costs and patient trajectories. We aimed to describe the incidence and type of injuries in Queensland, over a 5-year period, including describing costs and future readmissions.

This is a retrospective cohort study using administrative data from the Queensland Hospital Admitted Patients Data Collection (QHAPDC), clinical costings, and death registry was undertaken. Data for individuals admitted for acute care to Queensland hospitals between 1 July 2011 and 31 December 2016. Inpatient clinical costs and death data were also linked.

A total of 435,592 patients and 595,604 episodes of care were identified; 43% female, and 57% male, with a mean of 1.4 episodes of care.

The total cost for all public hospital episodes was \$3.3 billion, with a mean index injury episode cost of \$6,094 (females=\$5,771, males=\$6,336). The mean total cost per patient (i.e. across all public episodes) was \$7,543 (females=\$7,240, males=\$7,755).

The three most common principal diagnoses for episodes in our data were unspecified injury of head (n=23,536, mean episode cost=\$1,258), fracture to the lower end of the radius, with dorsal angulation (n=11,489, mean episode cost=\$4,608) and rupture of anterior cruciate ligament (n=8,788, mean episode cost=\$11,610).

The results highlight the substantial healthcare burden from injury-related admissions. Many patients have multiple episodes of care and incur high in-patient costs. Given these figures, ensuring efficient resource use to optimise patient outcomes is essential.

### Liver injuries in children: 24-year experience in a single pediatric tertiary trauma centre in Sydney

Tomomasa Hiramatsu, Ana Galevska, Soundappan Soundappan Sannappa Venkatraman, Andrew Holland

1. *Children's Hospital at Westmead, Westmead, NSW, Australia*

The aim of this study was to evaluate the demographics, injury pattern, and short-term outcome for the management of liver injury in children in The Children's Hospital in Westmead (CHW), a tertiary trauma centre in New South Wales. We conducted a retrospective review of all patients transferred to CHW and diagnosed with liver injury between January 1995 and March 2019. Medical records were reviewed and patients' age and sex, mechanisms and pattern of injury, management, and outcome were analysed. During the study period, 145 (85 male) children were admitted with liver injuries. Median age was 10 (5 - 13) years. Median Injury Severity Score (ISS) was 11 (5-17). Majority of cases was blunt injury as a result of motor vehicle collision. Mortality rate was 2.8% (four cases), one of which was died following massive hemorrhage due to liver rupture. The other three cases were associated with severe brain injury or other cause not directly related to liver injuries.

### Incidence, outcomes, and prehospital management of pediatric traumatic out-of-hospital cardiac arrest in Victoria, Australia

Zainab M Alqudah

1. *Monash University, Frankston, VIC, Australia*

**Aim:** Paediatric traumatic out-of-hospital cardiac arrest (OHCA) is a rare event with few survivors. We examined long-term trends in the incidence and outcomes of paediatric traumatic OHCA and explored the frequency and timing of intra-arrest interventions.

**Methods:** We retrospectively analysed data from the Victorian Ambulance Cardiac Arrest Registry for cases involving traumatic OHCA in patients aged ≤16 years arresting between January 2000 to December 2017.

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**Results:** A total of 292 cases were attended by emergency medical services (EMS), of which 166 (56.9%) received an attempted resuscitation. The overall incidence of EMS-attended cases was 1.4 cases per 100,000 person-years, with no significant changes over time. Unadjusted outcomes also remained unchanged, with 23.5% achieving return of spontaneous circulation and 3.7% surviving to hospital discharge. The frequency of trauma-specific interventions increased between 2000-05 and 2012-17, including needle thoracostomy from 10.5% to 51.0% (p trend <0.001), crystalloid administration from 31.6% to 54.9% (p trend= 0.004) and blood administration from 0.0% to 6.3% (p trend= 0.01). The median time from emergency call to the delivery of interventions were: 12.9 minutes (IQR: 8.5, 20.0) for cardiopulmonary resuscitation, 19.7 minutes (IQR: 10.7, 39.6) for external haemorrhage control, 29.8 minutes (IQR: 22.0, 35.4) for crystalloid administration and 31.5 minutes (IQR: 21.0, 38.0) for needle thoracostomy.

**Conclusion:** The incidence and outcomes of paediatric traumatic OHCA remained unchanged over an 18 year period. Early correction of reversible causes by reducing delays to the delivery of trauma-specific interventions may yield additional survivors.









## What is the ATS?

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